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Special issue: Universal health coverage in the South-East Asia Region
Volume 3, Issue 3-4, July—December 2014, 197–300

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Editorial Office
WHO South-East Asia Journal of Public Health
World Health Organization,
Regional Office for South-East Asia,
Indraprashta Estate, Mahatma Gandhi Road,
New Delhi 110 002, India.
Tel. 91-11-23309309, Fax. 91-11-23370197
Email: seajph@who.int
Website: www.searo.who.int/publications/journals/seajph
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On the occasion of the first Universal Health Coverage Day, on 12 December 2014, I am very pleased to release this special issue of the WHO South-East Asia Journal of Public Health on Universal Health Coverage.

Universal health coverage (UHC) has been receiving much attention worldwide from stakeholders across health and development. The Director-General of the World Health Organization (WHO), Dr Margaret Chan, has described UHC as “the single most powerful concept that public health has to offer”. Furthermore, Dr Chan has emphasized that UHC is “the best way to cement the gains made during the previous decade. It is the ultimate expression of fairness. This is the anchor for the work of WHO as we move forward”. In South-East Asia, I have made UHC a priority area for WHO’s work in the Region.

Member States of the South-East Asia Region have made significant contributions to the conceptual debate on UHC, as well as to its realization for population health. Member States have conceptualized UHC as both a means and an end for health: a means to improve health status by strengthening the three dimensions of UHC – population coverage, service delivery and financial protection; and, by applying the overarching principle of equity in policy decisions related to these dimensions, UHC may be considered an end in itself.

Thailand is acknowledged as having achieved sustainable UHC – at about US$ 5000 gross domestic product per capita at purchasing power parity – when it was categorized as a lower-middle-income country. This achievement is significant in a region where most countries are classified as low-income or lower-middle-income economies and where the cost of accessing health care is a key driver of poverty and inequity. Out-of-pocket (OOP) spending on health is more than 60% of total health expenditure – the highest among all WHO regions – and one third of new annual poverty is directly associated with health. The majority of OOP expenditure goes towards the purchase of medicines – in a region that includes India, which is known as the “pharmacy of the world” but has one of the lowest per capita government expenditures on medicines.

The pillars of UHC in Thailand provide useful guidance for other countries – evidence-based reform that emphasizes the “four A’s” of service delivery: accessibility through a network of primary care facilities with effective referrals; availability of needed services through appropriate human resources and other inputs; acceptable quality of care, especially in the public sector; and affordability of care, including medicines, based on government financing. Furthermore, the reforms changed the incentive structure, notably provider payment mechanisms, which allowed engagement with the private sector for UHC while containing costs and improving performance of the overall health system. Finally, the Thai experience underlines the central role of the government in steering the process of reform, backed by necessary legislation and credible regulation. Much has been achieved in the WHO South-East Asia Region, with important lessons for UHC for all countries and development partners. There are further quick wins for UHC in affordable access to medicines. However, much shall still need to be done in an increasingly complex health context. The current outbreak of Ebola virus disease in west Africa has emphatically underscored the critical importance of robust health systems for UHC. The changing epidemiological and demographic situation is now being influenced by factors outside the health sector – the cause and impact of ill-health requires the health sector to lead multisectoral action. This is clearly exemplified by noncommunicable diseases (NCDs) – the cause and impact of NCDs encompasses individual behaviour on the one hand, and overall economic development on the other; and the “best-buys” to address NCDs are prevention and promotion, with public information, legislation and regulation playing a crucial role. This special issue of the WHO South-East Asia Journal of Public Health documents original research, as well as country experience, analysing these for broader application. Importantly, most studies have been developed in collaboration with ministries of health, in a direct effort to inform policy decision and strategy formulation, thereby also making a significant contribution to the evidence base to advance UHC in the South-East Asia Region.

Dr Poonam Khetrapal Singh
World Health Organization
Regional Director for South-East Asia
Editorial

Universal health coverage in South-East Asia: documenting the evidence for a Regional Strategy

This special issue of the *WHO South-East Asia Journal of Public Health* brings together technical discussions, original research and country experiences in addressing some of the key challenges to universal health coverage (UHC). These papers have been commissioned or selected to strengthen evidence for policy in support of national UHC efforts, building on the work of the Regional Strategy for Universal Health Coverage.

Member States in the World Health Organization (WHO) South-East Asia Region are focusing on improving the equity and efficiency of their health systems and, consequently, most are reviewing their health-financing strategies as a lead area of reform for UHC.1–4 To support country strategies, WHO South-East Regional Office was requested to develop a Regional Strategy on Universal Health Coverage in consultation with experts from within and outside the Region. The Strategy was subsequently endorsed by Member States at the Sixty-fifth Regional Committee for South-East Asia in 2012, in resolution SEA/RC65/R6, and is now being used as a practical reference by both Member States and WHO as the South-East Asia Region moves forward on UHC.5 The Strategy documents technical issues and international experience in a systematic manner and, based on this, recommends four strategic directions to advance UHC in countries of the South-East Asia Region; described below, these comprise a conceptual strategic direction, two technical strategic directions and an action point.6 The papers included in this special issue provide further evidence on these strategic directions.

**Strategic direction 1: Placing primary health care oriented health systems strengthening at the centre of universal health coverage**

Countries in the WHO South-East Asia Region have defined UHC in different ways and are at different levels of achievement. The common underlying UHC policy goal in all countries is to improve equity in health. It is therefore useful to have a common framework for Member States and WHO, as a basis for taking forward the UHC agenda. UHC may be defined as having three dimensions:

- **universal** or a population dimension (who is to be covered);
- **health** or a service-delivery dimension (covered with which services);
- **affordability** or a financing dimension (covered at what cost).

The **definition** and **principles** of primary health care are relevant to informing strategic choices along these three dimensions – to provide a benefit package that gives priority to the health needs of the poor, and public health, delivered using appropriate technology and at sustainable cost. Using this definition, significant progress on UHC can be made at low cost and in resource-constrained settings. A pragmatic way forward is to phase in UHC, starting with primary health-care priorities to eliminate avoidable systems inequities and inefficiencies, plus extension to more comprehensive coverage as required systems and institutional capacities are developed.

**Strategic direction 2: Improving equity through social protection**

Out-of-pocket health spending in the WHO South-East Asia Region is the highest among all regions (over 60% of total health expenditures) and is a key driver of health-related inequities in the Region. Countries that have progressed well on UHC have reduced out-of-pocket health spending to less than one third of total health expenditure, with government spending at about 5% of gross domestic product. Therefore, countries are reviewing health financing as a lead area of health systems strengthening for UHC.

Experience suggests that the way forward in reducing inequities is through social protection, by shifting to mandatory pre-payment and consolidated pooling, through tax-based funding and/or social insurance contributions at national level. There is potential to raise additional financing through a higher share of government revenue or earmarked contributions to social insurance. Importantly, these options have been implemented successfully for social protection in contexts similar to those in countries of the South-East Asia Region.

**Strategic direction 3: Improving efficiency in service delivery**

In addition to improving equity or distributional efficiency through better health financing, technical and allocative efficiencies in service delivery are equally relevant for UHC – they determine which services are provided and at what cost and, therefore, who has access to them. In the South-East Asia Region, there is a push away from low-cost alternatives...
(notably prevention) to high(er)-cost curative care, driven by the dominance of private providers, who are often inadequately regulated; increasing burden of noncommunicable diseases; and access to high-end technology. The four main areas of broad systems inefficiencies are listed next.

- Expenditure on medicines is the largest component of out-of-pocket health spending in the Region, and experience highlights the significance of increased public investment in medicines, better price control and use of generic products.
- Experience also shows that provider payments can be used to “correct” the health systems incentive structure for human resources, to influence the type of service, cost of provision and overall performance in both the public and private sectors, including supporting public–private partnerships.
- In decentralized service-delivery structures, inequities between decentralized units must be minimized through, for example, needs-based criteria for allocation of central funds. Furthermore, it is also important to review administrative decentralization from the perspective of health systems needs and efficiency – some health functions, such as procurement or financing public health, may not be appropriate for decentralization.
- An effective response to address these issues requires strengthening of regulations to overcome political, administrative and information constraints.

Strategic direction 4: Strengthening capacities for universal health coverage

Evidence-based decision-making requires capacities to monitor and evaluate, and these need to be strengthened in many countries.

To mark the occasion of Universal Health Coverage Day, 12 December 2014, this special issue of the *WHO South-East Asia Journal of Public Health* on UHC contributes to this strategic direction, by providing a systematic documentation of evidence on the two technical strategic directions, to support Member States in advancing equity and efficiencies for UHC.

Alaka Singh
World Health Organization
Regional Office for South-East Asia, New Delhi, India

Address for correspondence:
Alaka Singh,
Health Economics and Health Planning Unit,
Department of Health Systems Development,
World Health Organization, Regional Office for South-East Asia, New Delhi-110 002, India. Email: singha@who.int

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12 December 2014 was observed as the first-ever Universal Health Coverage Day to keep momentum on the United Nations resolution, unanimously passed on 12 December 2012, endorsing universal health coverage (UHC) as a pillar of sustainable development and global security. The World Health Organization (WHO) along with The Rockefeller Foundation, World Bank Group, Oxfam, Save the Children, Management Sciences for Health and Action for Global Health, is an organizing partner of this global coalition of more than 500 organizations from over 100 countries, whose aim is to renew focus and galvanize action to achieve UHC.

Numerous publications and other media outlets have highlighted UHC at the local, regional and global level. Two articles, originally published elsewhere, are reprinted in this section to illustrate the breadth of reportage on UHC. The first article, a World Report from *The Lancet*, shows the challenges at the local level in Timor-Leste. The second article comes from the Results for Development (R4D) Institute, a non-profit organization devoted to advocacy, research and implementation of solutions to address development challenges in low- and middle-income countries. In this interview, Dr David Evans, Director of the Department of Health Systems Financing at WHO, makes the case for UHC as an organizing principle for the post-2015 health goals and discusses the role of WHO and other stakeholders in supporting countries to realize their UHC aims.
From The Lancet:
East Timor striving for universal access to health care

MORE THAN A DECADE ON FROM GAINING INDEPENDENCE, EAST TIMOR HAS MADE GAINS IN HEALTH BUT STILL FACES AN UPHILL BATTLE TO ACHIEVE UNIVERSAL HEALTH COVERAGE AND ACCESS. CHRIS MCCALL REPORTS.

A small half-island on the equator came to independence in ruins with high-quality, free health care for all as a key goal. More than a decade on, East Timor is still working to leave behind centuries of oppression, but idealism is not dead in the capital Dili. The people developing East Timor’s health system still want a future without the pitfalls of medicine in more prosperous countries.

When asked about his vision for East Timor’s health system, Health Minister Sergio Lobo says it is about access. He compares East Timor with its richer neighbours, Malaysia, Singapore, and Australia. In those countries, he says, not everyone can always access their world-class health services. “In Malaysia, Singapore, Australia, any problem, they will fix it. The services are there, but not for everybody”, Lobo told The Lancet. Lobo is a surgeon who trained in Indonesia, the country that brutally occupied East Timor for 24 years until 1999. As punishment for East Timor’s decision to vote for independence that year, Indonesia’s military and its East Timorese militia allies went on a rampage of violence, trashing the country and leaving nearly every house in ruins.

After 2 years of UN-led administration, it achieved independence in 2002. Many buildings have still not been repaired today, but a lot has changed. East Timor now has oil wealth from mineral resources in the Timor Sea to the south. Dili has shopping complexes and advertising hoardings. At least a few people now are visibly wealthy, even if most are clearly not. Even a new round of internecine fighting in 2006 is receding into history.

Much of the government’s new money has gone into building up the health system and results are starting to show. In September, WHO honoured East Timor for its rapid progress towards eradicating malaria, noting that only three deaths from malaria were recorded in 2013.

During the conversation, Lobo returns several times to his vision. He talks about having a socialist attitude to health, with a capitalist mentality. He talks about changing the mindset of the people from a hospital-based to a community-based approach. He talks a lot about public health and good use of money. “We opted for free health care for everybody and sometimes this is not used properly. I am conducting some studies on health financing. For now the commitment of the state is to go for free health care for everybody”, he said. “For us to have free health care for everybody, it has to be affordable.” Lobo has had some difficult decisions to make. Not long ago, he was criticised in parliament for buying motorbikes for his doctors instead of ambulances. His argument was that it was a better use of funds. For the price of 19 ambulances, he got 600 motorbikes. “They increase the mobility of the doctors. With one ambulance we spend a lot of money. Many times the patient dies during the trip—very bad roads”, he said.

MAKING PROGRESS

East Timor now has a medical school, a nursing school, and a midwifery school. The first post-independence government was led by the left-leaning Fretilin party. Fretilin negotiated for Cuban doctors to come in and the medical school has adopted a Cuban model. Not everyone is convinced it is the perfect one for East Timor.

The current health minister is part of a centrist coalition led by former resistance leader and current Prime Minister Xanana Gusmao. There are advantages and disadvantages in the Cuban approach, Lobo says. It is strong on public health, but less strong on basic clinical skills like suturing. In Cuba, where there is a highly structured health system, this is less of an issue than in East Timor, where many clinics are isolated.

From Dili’s harbour you can see an island called Atauro. By an accident of history it is part of East Timor. It has a dark history as a prison island for the Portuguese, the Japanese, and the Indonesians, who left thousands who opposed Indonesian rule there to survive or die.

Most of Atauro’s 10 000 people live a subsistence lifestyle, growing crops or catching fish. They now have a health clinic again, although the emergency room is basic. The island has

eight doctors and four nurses. It has an airfield and emergency flights by plane or helicopter are possible. Not long ago, cases requiring emergency surgery had to get to Dili by boat. Nurse Januario Soares says very few cases of malaria are now being reported. A few years ago, if they tested for malaria it routinely came back positive. His colleague Isabel Afonso is aged just 25 years and qualified as a midwife 2 years ago. She is part of the new generation of East Timorese medical professionals. Both trained in Indonesia, at different times.

WEAK INFRASTRUCTURE

Distance, time, and infrastructure are issues across the country. The centre is mountainous. The south coast is hard to reach by land transport.

Foreign health workers say it has also been held back by widespread superstitions—eg, a common belief that the first milk produced after childbirth, the yellowish colostrum, is bad for the baby. In some areas, it was routinely thrown out and replaced with sugar water, although such practices are becoming less common.

As an example of the infrastructure problems, the health minister cites the cost of sending a letter to Dili from one of the main regional towns, Viqueque. “If you want to send a letter from Viqueque to Dili you will spend around US$200. You have to send a car. We have no postal service. We are lacking the basic infrastructure”, Lobo said. “Many of the health-related issues are outside the competence of the Minister of Health.”

In the wet season, another problem is dengue fever, spread by mosquitoes like malaria. The country’s drains are poor and badly in need of renovation.

East Timor has no MRI scanner. There is one CT scanner but it is old. The only radiologists are two Cuban doctors. Radiology is limited and the machines often break down because of overuse.

Most of the health budget goes on salaries and medicines. A doctor can earn from $500 to $1500 a month, not a princely sum but more than adequate for a country like East Timor. However, there are very few medical specialists. Its homegrown medical graduates can practise in East Timor, but the local medical degree is generally not recognised overseas.

Unfortunately, the only places where these young doctors can do specialist training to international standards are all outside East Timor. Lobo says he is seeking ways around this situation, which might involve foreign specialists coming to work in East Timor with local doctors assisting, who then go overseas simply as observers.

One of the most insidious problems, however, is malnutrition, which potentially affects the next generation’s mental ability. East Timor’s population is young and growing, with around 1.1 million people. Malnutrition rates in children have slowly been coming down but in 2013 still stood at 51%. Many people walking around Dili are visibly thin. “It affects people in the most productive years of life, children of school age, in the periods where the brain is being formed. It will affect their IQ”, said Lobo.

In theory, doctors in rural areas are supposed to make two visits a month to children with malnutrition. But whether this is always possible is doubtful.

Not far from the minister’s office is that of another doctor, Dan Murphy, an American who came to East Timor at the time of the 1999 violence. At Bairo Pite clinic, ordinary East Timorese queue for hours to see “Dr Dan”.

East Timor should not be sitting on its laurels just yet, he says. The demands being made on the young East Timorese doctors are intense. Often they are virtually on their own in remote clinics with little support.

Malaria might be coming under control but the country remains disorganised and much basic work has not been done. There is no real pathology service at all, he says, making it pointless to take a biopsy even if it is clinically indicated. “We don’t even vaccinate newborns for hepatitis B”, Murphy added.

One of his main concerns is tuberculosis, which he says is shockingly common. Dealing effectively with it and providing good directly observed therapy, during which patients are regularly observed taking specialised antibiotics over several months, is a challenge, he says. It might involve doing things in cheap, non-traditional but effective ways.

“What you need is a network that goes all the way out to the village. Not necessarily a nurse. It could be someone who is trained up. In fact these people might do it better”, he said.

But when asked about what he would like to see in East Timor in the decades to come, Murphy’s answer echoes that of the minister. He also talks about injustice in health care and about how East Timor has a chance to do things right that other countries have not. “What we would like to see here is breaking down some of those barriers. And getting quality health care in the whole country”, Murphy said. “You have got to have good management. I am learning that the process takes a lot of time and you also have to have an ability to learn from your mistakes. Resources tend to accumulate at the top. Here we are starting to get some infrastructure. We can make a phone call to nearly every village now.”

But he added: “We don’t have development in enough areas to make health care really good and reasonable.”

His main concern is also similar to the minister’s. It is about how to maintain the uniqueness of this culturally rich half-island nation, where people flick between three or four languages as easily as picking up a piece of paper. “The trick is how do we develop East Timor and still maintain the beautiful quality of East Timorese people—being friendly, helping one another out”, he said.

Chris McCall
From the Results for Development (R4D) Institute: An Interview with Dr David Evans of the World Health Organization

Dr David Evans is Director of the Department of Health Systems Financing at the World Health Organization (WHO). His work covers a variety of areas including the assessment of health system performance and the generation, analysis and application of evidence for health policy; and the development of effective, efficient and equitable health financing systems.

In an exclusive interview with R4D, Dr Evans discusses the benefits of universal health coverage (UHC) as an organizing principle for the post-2015 health goals; country obstacles to achieving UHC; and the role of WHO, the private sector and global community in supporting country efforts.

Unlocking Solutions: What are your thoughts about Universal Health Coverage (UHC) as a post-2015 goal?

David Evans: I would have liked to see UHC as an organizing principle for the post-2015 health goal, under which the disease-specific sub-goals would fit nicely. That would have been desirable because UHC is something that ordinary people care about. They want the assurance that the health services they might need to enable them to promote or maintain health are available, good quality and affordable. This is the essence of UHC. They want the peace of mind that brings, although they also value the health improvement and the financial protection that UHC brings.

The other advantage of having UHC as an organizing principle for a health goal is that we would have had a chance of moving away from the “verticalization” of the last 15 years. The current draft of the sustainable development goals is not ideal from that perspective, being another series of vertical sub-goals, which could exacerbate the fragmentation of health systems we have seen in the past. We have moved well away from developing people-centered, integrated services, with financial protection, if donors insist on building laboratories for only one disease, or stand-alone clinics for one condition. Often, these donors will also ensure that their health workers are paid higher salaries, so they siphon scarce staff from primary-level care.

In some countries, a third constraint is political will, although we are seeing less of this. It is clear that people everywhere want UHC, and it has become an election issue in many countries. Politicians tend to follow these trends.

US: What are some of the biggest obstacles that countries will face as they move toward UHC?

DE: There are financial constraints. A country like Guinea, which spends less than $30 per capita on health each year even with funding from external partners, cannot move very close to UHC. More money for health is absolutely essential in many countries.

Another constraint is the verticalization and fragmentation of health systems that is happening, often at the instigation of external partners. Countries cannot develop people-centered, integrated services, with financial protection, if donors insist on building laboratories for only one disease, or stand-alone clinics for one condition. Often, these donors will also ensure that their health workers are paid higher salaries, so they siphon scarce staff from primary-level care.

US: What role will the private sector play in helping countries achieve UHC?

DE: It will not be able to protect the poor and the vulnerable from the financial risks of paying for needed health services, or to ensure they obtain the services they need, without government paying their costs. Public funding is essential, and this has to come from forms of compulsory prepayment and pooling, such as taxation, government charges, and insurance. So the financing for the poor and vulnerable has to be public. That being said, the question of who should deliver the services (prevention, promotion, treatment, rehabilitation, palliation) delivered from pooled funds must be answered pragmatically.

I do not think there is any evidence that public or private sectors deliver services more efficiently than the other – the evidence is at best mixed. My view would be that countries need to find the
From the literature

best mix that allows coverage with needed services to be scaled up as rapidly as possible, with good quality. Government needs to set rules and monitor progress, and it needs to pay to cover the costs of the poor and vulnerable, but in most countries a mix of public and private sector delivery is used.

US: What type of support will the global community need to provide?

DE: Having UHC in the post-2015 development goals and targets will be important. Countries will have an added incentive to make progress to fulfill this important wish of their own populations. Some countries will need more money. While it is true that many countries can raise more funds domestically, and that health systems everywhere could be more efficient, we cannot run away from the absolute shortages in funds in many countries. Sharing experiences across countries is also important. Countries really want to know what worked in other settings, and what did not work. I think the principles of what needs to be done are pretty well accepted, and now countries are wanting support on more detailed questions of implementation – e.g. what sort of laws are needed for UHC or for health insurance, how to develop systems of prospective payment for providers, what types of boards are needed for health insurance funds etc.

US: What is WHO doing to help countries tackle these challenges?

DE: We are a technical support agency, not a funding agency. We work with countries to develop national health plans and strategies to help them expand capacity to deliver health services of all types, and the health financing plans that can ensure access and financial protection. We support them with technical and policy advice on implementation of these plans. We help countries monitor and evaluate progress and modify plans where necessary. We help to share experiences across countries and adapt best practices. At the global level, we have been active in advocating for UHC in global fora and it has been a real pleasure for me personally to work closely with civil society organizations on this topic over the last few years, in addition to ministries of health and ministries of foreign affairs from countries across a wide range of income levels.

Nkem Wellington
Public financing to close gaps in universal health coverage in South-East Asia

Robert Yates

Given the three-dimensional nature of universal health coverage (UHC) – population coverage, services covered and the degree of financial protection – it is difficult to put an absolute figure on the number of people who have effective health coverage in any one country. However, following China’s rapid increase in coverage since 2009, it is clear that there are now more people without coverage in South-East Asia than in any of the other World Health Organization (WHO) regions. For example, it has been estimated that around 40 million people in India alone are pushed into poverty each year, as a result of health-care costs.2

However, the coverage picture across the Region varies tremendously, to the extent that South-East Asia also contains some of the most celebrated examples of countries that have practically reached UHC, even as lower middle-income countries. These UHC success stories include Thailand, whose famous Universal Coverage Scheme has helped improve health indicators and reduce impoverishment resulting from health-care costs since it was launched in 2002.1 Sri Lanka, too, has often been identified as a country that has outperformed its peers in achieving excellent health outcomes (its infant mortality rate is one fifth of India’s) and high levels of financial protection.4 Furthermore, Bhutan’s performance in providing universal free health care to its entire population is seen as one of the major contributors towards improving the country’s Gross National Happiness.5 Finally, both Bangladesh6 and Nepal7 have received international recognition for their expansion of coverage of selective packages of cost-effective health services.

How have these countries taken great strides towards UHC while some of their neighbours are struggling to reach population coverage rates of 50%? A common feature of these UHC pioneers is that these governments have used large increases in public financing to fund services for previously uncovered population groups – particularly in the informal sector. Furthermore, they have provided sufficient public financing and management oversight to persuade their populations to use these health units because the services provided are of adequate quality. How much has this cost? For the five countries of the WHO South-East Asia Region that have provided this universal entitlement to free health care (Bhutan, Maldives, Sri Lanka, Thailand and Timor-Leste), the average public health spending was 2.9% of gross domestic product (GDP) in 2012.8

In the meantime, the two biggest countries in the Region, India and Indonesia, are providing public financing to their health sectors to a level of only 1.2% and 0.9% of GDP, respectively. Furthermore, in these countries, only people pre-identified as being poor are entitled to be covered by tax-financed government health insurance schemes. This has left hundreds of millions of people (mostly in the informal sector) exposed to the risk of high health-care costs, with millions impoverished each year because they did not have adequate coverage. How might these countries and others in the Region, such as Myanmar and Bangladesh, close their gaps in population coverage?

One school of thought is that fully subsidized services should be restricted to the population living below the poverty line, and that people above this level should be encouraged to join health insurance schemes voluntarily. This has been a common approach in many low- and middle-income countries across the world but to date it has not been successful in reaching full population coverage. Countries tend to get stuck at a coverage rate of around 70%, with the bulk of the uncovered population consisting of near-poor people in the informal sector who cannot purchase health insurance. Thailand found itself in this situation at the start of the past decade, when it managed to reach 70% population coverage using a mixture of targeted social health insurance schemes. Even the richest economy in the world, the United States of America, has not been able to reach universal coverage using voluntary insurance, and around 43 million people remain uncovered.
The alternative approach, which has been shown to work in the success stories of the WHO South-East Asia Region and across the globe, is to close the coverage gap with a large injection of public financing to cover the entire informal sector. This is what Thailand achieved in 2002, with a 0.5% of GDP increase in tax financing, and also how China has increased coverage from 30% to 96% in the past decade, using an additional annual public health spending of 1.1% of GDP. Recent celebrated UHC successes in Brazil, Mexico and Turkey have followed a similar approach using compulsory public financing.

It is encouraging to note that these lessons appear to be being heeded now in countries of the WHO South-East Asia Region with lower coverage rates. In India, the recently elected government has announced that it will publicly finance a package of 50 essential medicines and diagnostic services free of charge to the entire population. Furthermore, at the state and provincial levels in India and Indonesia, political leaders are recognizing that they can close coverage gaps using local tax revenues. The free health card distributed to over 3 million people in Jakarta since November 2012 is perhaps the most striking recent example of a provincial government using tax resources to rapidly scale up population coverage. Moreover, as the architect of these reforms has just been sworn in as President of Indonesia, expectations are running high that this policy will soon be extended to the entire population.10

With health coverage becoming a more politicized and fiscal space that is growing in many countries, it will be fascinating to watch the WHO South-East Asia Region for developments in UHC in the coming years. In particular, it will be interesting to see whether national political leaders in these countries try to emulate their domestic and international peers in increasing public health financing to reach UHC. Evidence from within the region suggests that this would be a very good idea. Not only would such a policy improve health indicators and reduce impoverishment resulting from health costs, it would also potentially bring huge political benefits to the leaders who bring health services and financial protection to their uncovered populations.

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Reprioritizing government spending on health: pushing an elephant up the stairs?

Ajay Tandon, Lisa Fleisher, Rong Li, Wei Aun Yap

ABSTRACT

Countries vary widely with respect to the share of government spending on health, a metric that can serve as a proxy for the extent to which health is prioritized by governments. World Health Organization (WHO) data estimate that, in 2011, health’s share of aggregate government expenditure averaged 12% in the 170 countries for which data were available. However, country differences were striking: ranging from a low of 1% in Myanmar to a high of 28% in Costa Rica. Some of the observed differences in health’s share of government spending across countries are unsurprisingly related to differences in national income. However, significant variations exist in health’s share of government spending even after controlling for national income. This paper provides a global overview of health’s share of government spending and summarizes some of the key theoretical and empirical perspectives on allocation of public resources to health vis-à-vis other sectors from the perspective of reprioritization, one of the modalities for realizing fiscal space for health. The paper argues that theory and cross-country empirical analyses do not provide clear-cut explanations for the observed variations in government prioritization of health. Standard economic theory arguments that are often used to justify public financing for health are equally applicable to many other sectors including defence, education and infrastructure. To date, empirical work on prioritization has been sparse: available cross-country econometric analyses suggest that factors such as democratization, lower levels of corruption, ethnolinguistic homogeneity and more women in public office are correlated with higher shares of public spending on health; however, these findings are not robust and are sensitive to model specification. Evidence from case studies suggests that country-specific political economy considerations are key, and that results-focused reform efforts – in particular efforts to explicitly expand the breadth and depth of health coverage as opposed to efforts focused only on government budgetary benchmarking targets – are more likely to result in sustained and politically feasible prioritization of health from a fiscal space perspective.

Key words: fiscal space, government health expenditure, political economy, prioritization, universal health coverage

INTRODUCTION

Countries vary widely with respect to the share of government spending on health, a metric that can serve as a proxy for the extent to which health is prioritized by governments. World Health Organization (WHO) data estimate that, in 2011, health’s share of aggregate government expenditure averaged 12% in the 170 countries for which data were available.¹ However, country differences were striking: ranging from a low of 1% in Myanmar to a high of 28% in Costa Rica (see Figure 1). Even within the WHO South-East Asia Region, health’s share of aggregate government expenditure ranges from 14% in Thailand to 1% in neighbouring Myanmar.

Some of the observed differences in health’s share of aggregate government expenditure across countries are unsurprisingly related to differences in national income: cross-country comparisons show that higher-income countries generally spend a larger share of aggregate government expenditure on health. Health-care costs tend to be higher in richer countries, driven by relative-price differences as well as the availability of higher-technology care, among other factors.
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Richer countries also tend to have more educated and ageing populations with a preference structure that expects higher levels of public financing for social protection programmes. Higher costs of and more demand for publicly financed health care – combined with a greater fiscal and institutional ability to do so – are some of the reasons why governments tend to spend a greater share of aggregate expenditures on health as countries become richer. However, significant variations exist in health’s share of government spending even after controlling for national income.

This paper provides a global overview of health’s share of aggregate government expenditures and summarizes some of the key theoretical and empirical perspectives on why some governments spend more (or less) of public resources on health than others from the perspective of reprioritization, one of the modalities for realizing fiscal space for health. There are a variety of reasons why a focus on reprioritizing health’s share of government spending is important and merited from a fiscal space angle. Foremost among these are indications that the sector is under-resourced and that additional public financing for health is key for many low- and middle-income countries wanting to improve the levels and distribution of population health outcomes (including the Millennium Development Goals [MDGs]), reduce out-of-pocket (OOP) spending for health, and attain and sustain universal health coverage (UHC) for their citizens. In addition, ageing populations and the rising incidence of noncommunicable diseases (NCDs) are impending challenges that will imply higher levels of health expenditures across developing countries. In many countries, lack of government prioritization for health is often perceived to be a major constraint to increasing public financing for health.

**REPRIORITIZING HEALTH FOR FISCAL SPACE**

Fiscal space can be defined as “the capacity of government to provide additional budgetary resources for a desired purpose without any prejudice to the sustainability of its financial position”. Assessing fiscal space for health hence entails an evaluation of the different sources of financing that may be available for increasing government health spending, assuming that a clear case has been made to merit such an increase and the net societal benefits of increasing government health spending are positive. A conducive macrofiscal environment, higher revenues, increased borrowing, seigniorage (inflationary finance) and higher levels of development assistance are all potential sources of fiscal space (not just for health, but for any sector). Each option brings its own costs and benefits. While increasing revenues may ease fiscal constraints, the way they are raised is crucial: regressive, inefficient and excessive taxes can do more harm than good to the overall economy. Similarly, borrowing to finance current spending may seem like a good idea in the short-run, but could become unsustainable over time. External development assistance may ease budget shortfalls in countries that lack the domestic finances to cover the costs of high disease burdens, but it can bring its own...
set of negative externalities and inefficiencies. Seigniorage is rarely, if ever, a serious option to consider. Given clearly defined needs, the issue in any fiscal space assessment is one of identifying and assessing feasible, low-cost means of financing additional spending that minimize potential unintended adverse consequences, assuming multiple options have been identified and are available. From a sector-specific perspective, reprioritization implies that the government decides to increase a sector’s share of total government spending, preferably at the expense of spending on activities with relatively fewer net societal benefits. Reprioritization is hence the key intermediating link between the overall macrofiscal context of a country and how much a government chooses to spend on health.

Despite recent progress, several low-income countries – especially in sub-Saharan Africa and South Asia – are far from attaining health-related MDGs by 2015. This lack of progress in health outcomes appears even more egregious when one considers the fact that large proportions of child and maternal mortality are easily preventable via well-known cost-effective interventions. One key constraint to the attainment of health outcomes in low-income countries is the lack of adequate financial resources for health, recent increases in development assistance for health notwithstanding. And the MDGs themselves are explicit in acknowledging additional resource needs: included among the targets is a call for developed countries to commit at least 0.7% of their gross national income towards overseas development assistance. The WHO Report of the Commission on Macroeconomics and Health estimated that a minimum of US$ 34 in per capita health expenditures in 2001 prices would be needed in low-income countries to provide a basic package of essential health services. A more recent estimate by the Taskforce on Innovative Health Financing for Health Systems places the number at US$ 54 per capita. However, very few low-income countries spent even these minimal amounts on health in 2011. UHC – the objective of providing everyone access to quality health care when needed, without creating financial hardship as a result – is now an explicit and prominent policy objective in many middle-income countries. For example, countries such as China and Thailand now provide near-universal coverage; others such as Indonesia, Philippines and Vietnam cover 40–60% of the population. Coverage rates are lower in some lower-income countries, but even they have made progress in removing financial barriers for certain subgroups such as the poor, and for services such as those related to maternal and child health. UHC is also a likely post-MDG international development target. However, while strong policy commitments are evident, the design, organization and delivery systems for attaining UHC vary considerably, and remain a challenge. In particular, financing UHC programmes is a key constraint given the high levels of informality in labour markets, which make it difficult to collect premiums. At present, in many countries the poor are covered by general revenues and the formal sector is financed by contributions, leaving uncovered a large section of the population, consisting mainly of the nonpoor who work in the informal sector. Across many countries, the extent of UHC remains relatively shallow while OOP spending is generally high, even among those with coverage. The fiscal implications of expanding UHC to those still without coverage will largely depend on the extent to which costs are subsidized by governments. Also, governments are likely to face higher costs for supply-side expenditures to improve access to and the quality of care to meet growing demand, as well as to improve services to those already covered. Given the size of the informal sector and supply-side deficiencies, it is estimated that added fiscal resources of 1–2% of gross domestic product (GDP) will be needed to attain UHC targets in many low- and middle-income countries.

In summary, trends and policy commitments – attaining the unfinished MDG agenda, increasing and improving UHC, ageing, the rise of NCDs – are increasing fiscal pressures for health spending across developing countries. Reprioritization (combined with donor financing in low-income countries) will be necessary to address the fiscal space for health challenge, and that contributions from other modalities including general revenue increases, additional borrowing and inflationary financing are likely to be minimal at best. Making the case for reprioritization is also one of the key challenges faced by ministries of health, especially when dealing with ministries of finance, given that health is often perceived to be an unproductive and inefficient sector. The following sections provide an overview of the theoretical and empirical landscape on reprioritization for health to inform and motivate policy debates related to this issue.

REPRIORITIZING HEALTH: THEORETICAL PERSPECTIVES

Several theoretical approaches, gleaned primarily from the field of economics, address the role of government in economy and society. These approaches can be divided broadly into two approaches: a normative approach and a positive approach. The former focuses on how governments should make choices regarding overall expenditures and allocations to health, while the latter emphasizes the reasons behind observed government policy choices.

From a normative theory perspective, key economic rationales for government intervention in the health sector are market failures and equity-related considerations. Government intervention can – under certain conditions and in principle – be used to improve efficiency when market failures lead to suboptimal social welfare outcomes, and to improve equity when market allocations lead to outcomes that are perceived to be unfair. Three broad forms of market failures prominent in the health sector as justifications for government intervention in health are: (i) the presence of externalities, (ii) the public good nature of certain health interventions, and (iii) the presence of extensive information asymmetries. However, from the perspective of reprioritizing health, these same economic rationales also apply to government intervention in other sectors including national defence, education, food, housing, water, sanitation and infrastructure (although it could be argued that information asymmetries in health are more pronounced than in some of the other sectors). In terms of allocating resources across sectors, the normative economic theory perspective argues that – given real costs to society of
raising revenues – public expenditures should be undertaken as long as the benefits from such expenditures (for any given sector) exceed the costs of raising revenues, and that sectors should compete for the allocation of scarce resources up to the point where the marginal benefit of an additional resource unit of spending is equal across sectors. From the perspective of reprioritization, normative theory implies that the health sector would need to demonstrate that the social benefits of additional public spending exceed the costs of financing this increase in spending, both in terms of the additional costs of raising revenues and in terms of foregone public spending in other sectors. Despite the clean logic underlying normative economic theory, it provides limited utility to understanding why some governments spend more of their resources on health than others. With its focus on the ideal or optimal role for policy intervention by a benign government that intends to maximize social welfare, the normative approach neglects the substantial disconnect between a theoretically ideal set of policies and what could actually be achieved in practice.

Unlike the normative approach, the positive economic approach to understanding government behaviour is more promising as a guide to understanding government prioritization choices and expenditure allocations across sectors. Positive economic theories are those that describe “…why existing policies are pursued and…which policies will be pursued in the future”. This approach attempts to bridge the disconnect between a theoretically ideal set of policies as outlined by normative economic theory versus what is actually implemented in practice. Wagner’s law, mentioned earlier, is an early example of a positive perspective on public expenditure. Most positive theories of public expenditure invariably focus on political economy considerations: that is, on what influences policymakers. Ultimately, because choices about policy directions are made and implemented by individuals, the most relevant positive theories on the role of government are those that seek to explain the behaviour of individuals in a political setting. Such positive theories emphasize that individuals (the political arena are no different than individuals in any other market and are guided to make decisions by their own self-interests. In other words, voters in democracies, for example, might be expected to support candidates and ballot propositions that they think will make them better off personally; bureaucrats would make choices based on considerations that advance their own careers; and politicians make allocation choices based on what is most likely to keep them in power. Whereas a normative economic perspective argues for a focus on market failure, positive economic perspectives argue for a focus instead on government failure, that is, on what might cause governments to deviate from making socially optimal choices. From the perspective of reprioritization for health, positive theories generally imply that demonstrations of social-welfare-enhancing aspects of additional government health spending will not necessarily be effective in increasing allocations towards health. Political economy considerations are key, and enhancing democratization, improving citizen information and increasing government accountability may be more effective strategies to ensuring that health is accorded the priority it merits.

Cross-country empirical literature on factors determining why some governments spend more as a share of their total expenditures on health than others is scarce and, in some cases, focuses on government health spending as a share of GDP and not as a share of total expenditure, obfuscating the link to the issue of prioritization per se. One key determinant in cross-country empirical studies focusing on health’s share of government expenditure is the level of democratization of a country. On average – perhaps a result of some of the factors discussed in the previous section – democratic societies and those with higher degrees of political liberty do tend to devote a larger share of government expenditure and GDP to health even after controlling for confounding factors. The other factor to receive attention in empirical studies has been corruption. Most empirical evidence concludes that higher corruption levels are generally inimical to government allocations for health and favour spending on defence and energy at the expense of health, perhaps because of the higher possibilities of rent-seeking of the generally larger scale of contractual procurement amounts in the former sectors. Other determinants of government allocations to health include the extent of ethnolinguistic heterogeneity in a country and female political representation. Empirical research on the impact of heterogeneity on government spending on public goods suggests that governments generally tend to spend less on health in ethnolinguistically diverse societies, controlling for the level of development, education, availability of public resources and corruption. A study examining the relationship between female political representation and government spending on health as share of GDP in low-, middle- and high-income countries finds that there is a positive association between female political representation and government spending on health as share of GDP, although not a strong one. The numbers of cross-country empirical studies on this issue are few, and some of the findings are not robust and are sensitive to model specification. This is an area that could benefit from further research and analysis.

Other empirical evidence comes from the experience of countries that have attempted to reprioritize health in government spending in recent years, some more successfully than others. In this regard, the experiences of five countries – Brazil, India, Mexico, Thailand and Viet Nam – can be used to illustrate the following three modalities of reprioritization efforts. First, benchmarking expenditures: focused on setting broad benchmarks and targets for the share of government health expenditure. Second, earmarking revenues: earmarking certain taxes and other revenues to finance an increase in the share of health in government spending. Third, focusing on results: focusing on specific coverage targets or improvements in health-system outcomes.

India, a federation composed of 29 states and seven union territories, is a recent and prominent example of a country that has attempted to benchmark expenditures to reprioritize health. The Prime Minister of India pledged to increase government expenditure on health to between 2% and 3% of GDP by 2012,
up from about 0.9% of GDP in 2005. This pledge followed the 2004 election of an alliance led by the Congress Party that initiated several social protection schemes aimed at benefiting the rural poor, taking advantage of an increase in overall fiscal space resulting from a period of sustained and robust economic growth. For India to realize the 2–3% expenditure target, health expenditure by states would have had to increase by 22–38% per year over the period 2005–2012, a virtual impossibility.22 Since 1990, there has been a steady increase in central government health expenditure as a share of GDP in India, but this was offset by declining state allocations to health for most of 1990–2010 (see Figure 2). The decline in state-level allocations to health can be traced back to the fiscal crisis that impacted the states in the 1990s. Although there has been an upward trend in state health expenditure beginning around 2008, the country remains far from attaining the 2–3% of GDP benchmark for government expenditure on health.23 In 2011, India spent only 1.2% of its GDP on health.

India’s experience of reaching health-spending targets is not unique: Generally, countries have not realized benchmarking pledges. Other examples include Lao People’s Democratic Republic, which plans to increase its spending on health as a share of GDP in India, but this was offset by declining state allocations to health for most of 1990–2010 (see Figure 2). The decline in state-level allocations to health can be traced back to the fiscal crisis that impacted the states in the 1990s. Although there has been an upward trend in state health expenditure beginning around 2008, the country remains far from attaining the 2–3% of GDP benchmark for government expenditure on health.23 In 2011, India spent only 1.2% of its GDP on health.

Allocating 15% of government spending for health, and countries in the WHO Eastern Mediterranean Region have agreed to earmark 8%.24,25 In most countries, calls for benchmarking health’s share of government expenditures (or of revenues or GDP) have been largely aspirational.

Reprioritization efforts have been somewhat more successful in some countries that have implemented earmarks, that is, legally binding mandates that determine how GDP or aggregate government spending will affect the share allocated to health, as opposed to benchmarks. For example, in Viet Nam, Resolution No. 18, which was passed by the National Assembly, commits the government “…to increase the share of annual state budget allocations for health, and to ensure that the growth rate of spending on health is greater than the growth rate of overall spending through the state budget”.27 As a result, health’s share of the general government budget increased from 8% in 2008 to 9.4% in 2011.27 In Brazil, states and municipalities have been responsible for financing and managing health care since the 1996 health-financing reforms. In 2000, a constitutional amendment was passed that committed budget resources at the federal, state and municipal levels. At the federal level, the amendment required a 5% increase in aggregate spending in 2000 in real terms, using the 1999 budget as a basis, adjusted according to the growth rate of nominal GDP from 2001 to 2004. At the state and municipal levels, earmarks for health were 12% and 15% of their revenues, respectively. The share of health in public expenditures increased from 4% in 2000 to 9% in 2011.28 This earmarking of revenues appears to have:
(i) increased the share of state and municipal governments in health financing; (ii) provided incentives to decentralize primary care according to federal guidelines; and (iii) reduced the inequalities in per capita health expenditures among municipalities.

Some countries have raised resources by earmarking specific taxes (that is, other than dedicated payroll tax earmarked for social health insurance) such as on cigarettes and alcohol consumption. For example, Ghana earmarks part of its VAT revenues for its national health insurance fund. A study by the WHO indicates that more than 20 countries earmark tobacco tax revenue specifically for health.29 Several countries earmark all of their tobacco tax revenue for health, while other countries, such as Mongolia, Thailand, Qatar and Bulgaria, earmark a small percentage (that is, 1–2%) of the total tobacco tax revenue to health. Still other countries, such as Tuvalu, earmark a fixed amount (that is, 2 cents) per cigarette for the health sector. Earmarking taxes on alcohol seems to be less common, although some countries (for example, Thailand) do have policies that allocate a portion of tax revenue from alcohol to health. After substantial opposition from interest groups, the Philippines Senate recently passed a Sin Tax Reform Law, which earmarks a portion of tax revenues for UHC and district and regional hospitals.

Over the past decade, Mexico and Thailand have both witnessed substantial increases in the share of the government expenditure allocated to health, as reforms in both countries expanded coverage and reprioritized health issues, by focusing on results such as explicit coverage targets or health outcomes. Mexico embarked on a major health insurance reform process in 2003 with the intended result of including 50 million Mexicans who were previously excluded and to do so through “financial harmonization” of “imbalances”. By the end of 2011, UHC was achieved with almost 98% of Mexico’s citizens registered with one of the country’s three health insurance schemes: the Instituto Mexicano del Seguro Social (IMSS), which covers salaried employees in the private sector; the Instituto de Seguridad y Servicios Sociales de los Trabajadores del Estado (ISSSTE) for salaried workers in the public sector; and the Seguro Popular scheme for nonsalaried workers, self-employed and families outside the labour force.30 Due in part to the mobilization of resources for implementation of these reforms, the ministry of health’s budget increased 42% between 2000 and 2010, while the IMSS and ISSSTE budgets increased 42% and 103% in real terms, respectively. Some additional funding comes from earmarked taxes on cigarette sales, although the sequencing of reforms suggest that it is the focus on results that led to the demand for and absorption of these additional resources. The Mexican example of a focus on expanding coverage is not unique. In 2001, Thailand made an explicit policy decision to expand coverage to the remaining 18.5 million Thai not covered by existing health insurance schemes through the “30 baht treat all” scheme, funded initially by pooling budgets from public hospitals and other health facilities.31 This Universal Coverage Scheme (UCS), together with the Social Security Scheme (SSS), which covers private sector employees (excluding their dependants), and the Civil Servant Medical Benefit Scheme (CSMBS) for government employees and dependants (parents, spouse and two children under 20), meant that Thailand had attained UHC, which subsequently increased the utilization of health services and led to a substantial increase in government health expenditure between 2001 and 2010.32 Over this period, WHO data indicate that general government expenditure on health as a percentage of the general government budget increased from 9% to 13%. In addition, general government expenditure on health as a percentage of the total health expenditure increased from 56% in 2001 to 75% in 2010. Within just the first year of the launching of the UCS, general government expenditure on health increased by 42% to US$ 2.7 billion, from US$ 1.9 billion just prior the UCS in 2001. This upward trend has continued since, reaching US$ 7.4 billion in 2008, a 76% increase in real terms. Even during the Thai recession of 2009, when national GDP declined by 2% and various sectors faced spending cuts, government expenditures on health were sustained and protected.

CONCLUSION

The share of total government expenditure that is devoted to health is often used as a metric to gauge the extent to which health is prioritized by governments. While there is a clear income gradient in health’s share of the government expenditure across countries, significant variations persist even after controlling for income. Although a government’s spending on health is only one element that contributes to health outcomes in any country, understanding why some governments allocate a higher share of their resources to health than others is important given under-resourcing of the sector in light of policy objectives aimed at attaining MDGs and accelerating progress on UHC.

Theory and cross-country empirical analyses do not provide clear-cut explanations for the observed variations in government prioritization of health. Evidence from case studies on reprioritization is more promising, suggesting that country-specific political economy considerations are key, and that results-focused reform efforts – in particular, efforts to explicitly expand the breadth and depth of health coverage as opposed to efforts focused only on government budgetary benchmarking targets – are more likely to result in a sustained and politically feasible prioritization of health from a fiscal space perspective.

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Universal health coverage reforms: implications for the distribution of the health workforce in low- and middle-income countries

Barbara McPake,1,2 Ijeoma Edoka2

ABSTRACT

To achieve universal health coverage (UHC), a range of health-financing reforms, including removal of user fees and the expansion of social health insurance, have been implemented in many countries. While the focus of much research and discussion on UHC has been on the impact of health-financing reforms on population coverage, health-service utilization and out-of-pocket payments, the implications of such reforms for the distribution and performance of the health workforce have often been overlooked. Shortages and geographical imbalances in the distribution of skilled health workers persist in many low- and middle-income countries, posing a threat to achieving UHC. This paper suggests that there are risks associated with health-financing reforms, for the geographical distribution and performance of the health workforce. These risks require greater attention if poor and rural populations are to benefit from expanded financial protection.

Key words: health-care financing policies, health insurance schemes, human resources for health, geographical imbalances in the distribution of health workers, universal health coverage, user fees

INTRODUCTION

Over the past decade, there has been a growing momentum towards achieving universal health coverage (UHC) in low- and middle-income countries. With this aim, a range of health-financing reforms, including reduced reliance on user fees, increased tax-based funding, and social health insurance schemes, have been designed and implemented across different countries, with varying paces of development and degrees of success. The main objectives of these reforms have been to increase efficiency and equity in the utilization of health-care services by widening population coverage, particularly for the poor and vulnerable, while offering financial protection from out-of-pocket payments. The focus of much research and discussion has been on the impact of health-financing reforms on population coverage, health-service utilization and out-of-pocket payments. The implications for human resources for health have often been overlooked. Although financial barriers represent an important barrier to universal access to health-care services, the availability of an appropriate mix of the health workforce is equally fundamental, given that the health workforce is a crucial component of the functioning of the health-delivery system. However, shortage of skilled health workers and geographical imbalances in the distribution of skilled workers persist in many low- and middle-income countries, and progress in implementing the 2008 Kampala Declaration has been slow,1 posing an important barrier to achieving universal access to health-care services.

Many low- and middle-income countries fall short of the Joint Learning Initiative (JLI)–World Health Organization (WHO) benchmark of 2.28 health workers (doctors, nurses and midwives) per 1000 population.2 For example, five out of the ten countries in the Association of Southeast Asian Nations experience shortages in their health workforce according to this benchmark.3 National averages often mask geographical imbalances that exist even among countries that are not classified as experiencing critical shortages. For example, in 2010, Thailand reported a national level of 2.55 doctors and nurses/midwives per 1000 population.4 However, the density of doctors and nurses/midwives in Bangkok, the capital, was seven times and two times higher, respectively, than the density in the north east, the poorest region. In Timor-Leste, approximately 85% of general medical practitioners were...
concentrated in urban areas in 2011. In 2006 the density of doctors in urban Java, Indonesia, was one per 3000 population but one per 22 000 population in rural Java.

Similar geographical imbalances have been reported in other low- and middle-income countries, including countries in sub-Saharan Africa, where 36 out of 47 countries experience critical shortages in the health workforce. For example, in 2009, the density of both public and private sector doctors, nurses and midwives per 1000 population in Ghana was over 2.28 in Greater Accra, while the corresponding density in the poorer northern region was only 0.67, almost four times lower.

Several factors may explain geographical imbalances in the distribution of the health workforce. Lower demand for health workers (owing to lower ability to pay), more limited health-care infrastructure, unavailability of equipment and supplies, unfavourable job characteristics (such as longer working hours, higher workload and working in professional isolation), as well as lower standard of living in rural areas, all affect the supply of health workers to rural areas, the extent of which varies across country settings.

Higher concentrations of skilled health workers in wealthier urban areas mean that increasing financial protection for the poor and populations in remote and rural areas will not improve outcomes in those areas without a concurrent strengthening of the health workforce. Therefore, in designing health-financing reforms, more attention needs to be directed towards understanding implications for incentive structures and distribution of the health workforce.

Disequilibrium implies shortages (when demand exceeds supply) or surpluses/unemployment (when supply exceeds demand). For example, barriers to entry into the health labour market due to training and regulatory (professional licensing) requirements constrain the ability of labour supply to respond to changes in demand. Furthermore, the centralization of wage-setting (in public-sector employment) results in local shortages and surpluses when wage rates fail to capture regional differences in job attributes and environmental conditions. Inflexibility of wage rates results in persistent shortages in rural regions, when wage rates fail to adjust upwards in response to low supply, in order to attract health workers into these regions. There is also an uneven competition between public and private sectors in the demand for the services of health professionals. The sectors are interdependent on both the demand and the supply side: patients “shop around”, looking for effective, affordable services at multiple locations in both sectors. Health professionals often hold multiple jobs and serve both sectors.

METHODOLOGY

A search of peer-reviewed and grey literature was conducted in May 2013 using databases PubMed, Google Scholar, Science Direct and the Human Resources for Health Global Resource Centre. Publication date was restricted to between 2000 and 2013. Key terms used in the search (singly and in combination) were “health financing policies”, “health workforce distribution”, “human resources for health”, “universal health coverage”, “health insurance schemes” and “user fees”. In addition, references cited within selected articles were accessed to obtain further information. Only articles published in English were retrieved and reviewed.

Abstracts were reviewed and articles were selected based on the following criteria: articles focusing on both health-financing policies and health workers’ motivation, performance and distribution; articles focusing on both health-financing policies and the utilization of health-care services; and articles focusing on health-financing policies, reimbursement mechanisms and the distribution of financial resources. Articles that focused solely on health-financing policies without a component of human resources for health, or without addressing the distributional impact on utilization and financial resources, were excluded. Overall, the 21 articles included in this review comprise original studies (that applied both quantitative and/or qualitative methods) and literature/systematic reviews conducted from the perspective of low- and middle-income countries.
However, the dominant explanation of rural shortage of health workforce is likely to be insufficient effective demand relative to the need for services. Despite the set of measures taken by governments to subsidize demand in such areas, which include the attempt to provide free services and, in many cases, additional allowances for rural practice, the effective demand of richer users in urban areas often out-competes governments’ efforts. Even in the presence of rural allowances, health professionals may still have higher earning capacity in urban areas, through more lucrative private-sector opportunities; and in both rural and urban areas, professionals may give insufficient attention to public-sector work, being drawn away by private-sector demand. Such incentives are exacerbated by weak regulation that fails to impose penalties for the neglect of public-sector work.15–14

In this context, reducing financial barriers to accessing care will not resolve inequities in geographical access unless financial flows support growing effective demand for health services in those areas, and for those (poor populations) whose own purchasing power is limited. A labour market perspective suggests that growth in effective demand is the force that can attract the time and effort of health workers to provide care. This implies that removing fees or mandating social insurance coverage for such groups will not in itself improve access: the critical factor will be how the rules that govern resource flows operate to direct resources, or not, to those areas that lack endogenous purchasing power and have historically been deprived.

The ability to support effective demand in the public sector depends on a country’s fiscal capacity. Under traditional public-sector rules, the wages of public-sector health workers are financed largely directly, through budgetary allocations to ministries of health, often constrained by fiscal capacity and macroeconomic targets.15 Public health workers’ wages account for a high proportion of total government expenditure on health in many low- and middle-income countries,2,15,16 and since these countries face constraints in their overall fiscal space, increasing allocations to the health sector is challenging. Bossert and Ono suggest that the target of 2.28 health workers per 1000 population is unattainable, without an unrealistic allocation of resources to the health sector (more than 8% of gross domestic product) in 52 out of 166 countries for which they performed the calculation.17 However funds flow, Bossert and Ono’s analysis suggests that more emphasis needs to be placed on improving efficiencies in the utilization of available resources, including improving the skill mix of health professionals and relying less on doctors and other high-cost health professionals.17

**HEALTH-FINANCING POLICIES AND THE GEOGRAPHICAL DISTRIBUTION OF THE HEALTH WORKFORCE**

As highlighted in the preceding section, wage rates and opportunities for salary top-ups are important financial factors, suggesting that health workers will be attracted to areas where there are higher financial returns. In addition, the availability of financial resources can facilitate the provision of other non-financial incentives, such as improvement of the work environment, infrastructure and equipment – incentives that equally influence the location choices of health workers.9,10 Health-financing policies can affect health-worker distribution outcomes through both routes. They may also affect other non-financial determinants of recruitment and retention. For example, if they involve a more devolved budgetary process, or one more influenced by local performance, they increase the importance of local managers in the lives of health workers, and their perceptions of their managers’ competence and fairness may come further to the fore. Financing policies are a powerful signaler of government priorities,16 and, as such, their impacts can reflect both on health workers’ economic well-being and on their sense of being valued by the system. This section discusses recent financing reforms (user-fee removal and expansion of social health insurance) that have responded to UHC policies in a range of countries and reflects the limited evidence base on how health workers have been affected, with what implications for the distribution of human resources for health in terms of numbers and performance.

**User-fee reforms**

Following years of debate and discussion on user-fee policies, there now appears to be a general consensus on the need to shift to fairer means of financing health-care services. The focus of recent research has been on the impact of abolishing user fees on the utilization of health services and on population health outcomes, while the implications for the distribution and performance of the health workforce have received less attention. Out-of-pocket payments represent an important barrier to accessing health-care services.19–22 Therefore, the removal of user fees is likely to result in an increase in the demand for, and utilization of, health-care services, a trend that has now been reported widely across a range of low-and middle-income countries following changes in user-fee policies.23–26

While being potentially important for population health, higher utilization of health-care services also imposes an extra burden on the health workforce, particularly in rural and remote areas.26–28 In several low- and middle-income countries, health-care workers have reported an increase in their workload and, as a consequence, a decline in motivation and an increase in the desire to resign from their positions.29–32 The decline in health workers’ motivation is further exacerbated by the loss of supplementary income or bonuses previously provided by user-fee revenues, as well as the loss of locally managed funds that can be used to improve working conditions in other ways. Revenue generated through user fees contributes a significant proportion to total revenue, particularly for lower-level health facilities, and allows greater flexibility in the recruitment and remuneration of local support staff.33–35 Therefore, compared to the impact on higher-level health facilities, the abolition of user fees is likely to have a greater impact on lower-level health facilities, owing to their greater reliance on user-fee revenues to cover both salary and non-salary costs. Other studies report increases in the utilization of health-care services that are particularly strong in deprived and rural areas,26 disproportionate loss of locally generated revenues in rural...
areas compared to urban areas, and resulting redundancies of support workers.

A range of mechanisms have been created to compensate health facilities for loss of user-fee revenue, as well as to cover costs for providing free health-care services. Health equity funds in Cambodia provide a budget that covers the fees of those exempted, so that the health facilities that are required to exempt larger proportions of patients are not disadvantaged. User-fee replacement grants were provided in Zambia and Uganda. Incentive payments related to the volume of service provision that is free of charge were provided in Nepal. The experience of these mechanisms suggests that the incentives implied by the basis on which they are paid, and the management and control over the provided funds, are important in determining their implications. For example, reimbursement rules in Senegal provided higher levels of reimbursement at higher-level facilities, with implications for the attractiveness of higher and lower levels of the system as workplaces.

However, in five case studies (in Ghana, Nepal, Sierra Leone, Zambia and Zimbabwe) of the implication of removing user fees for the distribution of human resources for health, a number of expectations based on these ideas were confounded. Utilization increases following user-fee removal were often not sustained. Multiple concomitant policy changes made assessment of user-fee removal alone difficult. Nevertheless, the logic that pro-poor increases in demand imply stresses on the health workforce and other supply components exactly where the poor rely most for health care, confirms that planning the supply-side response to demand-side intervention is critical in determining impacts for health-workforce situations and, in turn, for population health.

**Health insurance schemes**

Pooling funds through voluntary or compulsory health insurance schemes can improve equity in both the financing (distributing the financial burden according to ability to pay) and use of health care (improving access for the sick and poor). Social health insurance, organized on this principle, has been expanding across low- and middle-income countries.

Under these schemes, health providers are reimbursed for providing health-care services to the population, through a predetermined reimbursement mechanism. As highlighted in the previous subsection, variations in reimbursement mechanisms across different levels of health-care facilities can accentuate geographical imbalances in the distribution of the health workforce. However, even when uniform reimbursement rules are applied, facilities with more sophisticated infrastructures are likely to attract higher reimbursements for providing more sophisticated health-care services compared to lower-level facilities. As a consequence, financial resources can be distributed disproportionately, favouring regions or areas with a higher concentration of high-level facilities and infrastructures.

For example, in Ghana, under the National Health Insurance Scheme (NHIS), health-care providers are reimbursed on a pay-by-episode-of-care basis, according to disease groups (diagnosis-related groups or DRGs). Although revenue generated by health facilities through NHIS reimbursements has grown significantly since the inception of the NHIS in 2005, evidence suggests that this growth is unevenly distributed across different locations (urban versus rural) and different levels of health facilities, with hospitals attracting a larger proportion of NHIS reimbursements compared to lower-level health-care facilities.

This heightening of pro-urban bias in the distribution of financial resources, as an unintended consequence of the NHIS, may leave rural areas with less financial leverage to compete with higher-level facilities in attracting and retaining health workers.

Similar impacts of the expansion of social health insurance schemes in Asia have been noted. Obermann et al. identify the impact of expanding health insurance in the Philippines as early as 1969, with increasing emphases on urban, curative and higher-level care, and Kondo and Shigeoka identify the same tendency from the early period of expansion of health insurance onwards, in Japan.

In Thailand, Hughes et al. describe the problems that arose from the failure to identify the effects on incentives in the local health system of both lower payment levels and weaker incentives attached to funding mechanisms for preventative care, when insurance mechanisms replaced traditional public funding mechanisms for curative care. These examples show the failure to support effective demand for critical rural, preventative and lower-level care, which is likely to imply a decreasing ability to attract staff to those roles. Furthermore, Erlyana et al. show that individual demands are less stimulated by reducing financial barriers in rural rather than urban areas in Indonesia. Demand in rural areas is far more influenced by distance than by price, suggesting a further bias in the financial, and consequently likely health workforce, impact.

Few examples can be cited of social health insurance schemes that have incorporated within their design features measures that are aimed at explicitly addressing rural–urban imbalances in the distribution of health workers. Thailand’s attempt to do so illustrates the difficulties. Under the reform, global budgetary allocations to provincial health authorities from the central ministry of health were replaced by capitation payment adjusted for population–age structure, and the rates were set so as to reallocate resources to lower levels of the system and rural areas, as a mechanism for securing redistribution of staff along the same lines. However, the proposed mechanism was not implemented, following pressure from powerful actors in the system whose interests were threatened.

**CONCLUSION**

Policies designed to achieve UHC have largely focused on reducing financial constraints to accessing health care, or on the “demand-side”. The principal mechanisms associated with UHC have been the removal of user charges, and the expansion of social health insurance. Measures to support a supply-side response that is sufficient to achieve UHC objectives have received less attention.
This paper has focused on the issues arising from health-financing reforms with UHC objectives, for the health workforce. Shortages and maldistribution of the health workforce are a critical constraint to the supply-side response to UHC policies. This paper suggests that lack of attention to this constraint is a common phenomenon that threatens the achievement of UHC. Furthermore, some elements of financial reforms may worsen rather than alleviate this constraint.

User-fee removal may increase workload, reduce opportunities for additional financial rewards for rural staff, and restrict the ability of local managers to alleviate resource constraints in enabling adequate working conditions and additional support staff. These problems are often particularly acute in rural areas. Social health insurance frequently applies payment mechanisms that preferentially allocate resources to urban, curative and higher levels of the health system. Attempts to avoid this in Thailand have proved difficult to implement in the face of political opposition.

Recognizing that the size of the health workforce and its distribution is the outcome of labour market processes implies that the impact of these changes may be to exacerbate workforce imbalance, and, ironically, to reduce access to care of poor and rural populations, in contrast to policy intentions. Further policy innovation is needed to find strategies that avoid this outcome, while containing political opposition. If, like Thailand, other countries also find that capitation mechanisms cannot secure redistribution of the health workforce, other possible strategies could involve earmarked funding for deprived areas and facilities that protect them against potential losses from new payment mechanisms; and protected vacancies in the most critical roles, funded at a level that makes those roles attractive. These policies may have the greatest chance of success if they earmark sources from additional funds for the health sector, which are often planned in the pursuit of UHC, rather than seeking to redistribute resources (financial or human) from well-resourced facilities and areas towards less well-resourced ones.

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The application of social impact bonds to universal health-care initiatives in South-East Asia

Michael Belinsky, Michael Eddy, Johannes Lohmann, Michael George

ABSTRACT

Social impact bonds (SIBs) have the potential to improve the efficiency of government health-care spending in South-East Asia. In a SIB, governments sign a pay-for-performance contract with one or several providers of health-care services, and the providers borrow up-front capital from investors. Governments outside South-East Asia have started to experiment with SIBs in criminal justice, homelessness and health care. Governments of South-East Asia can advance the goal of universal health care by using SIBs to improve the efficiency of health-care service providers and by motivating providers to expand coverage. This paper describes SIBs and their potential application to health-care initiatives in the Region.

Key words: development, health policy, payment for results, social impact bonds, South-East Asia, universal health care

INTRODUCTION

Social impact bonds (SIBs) have gained attention worldwide, for their promise to increase funding for social programmes, improve social outcomes and create enduring partnerships among participants from the private, social and public sectors. However, the application of SIBs to health care in development remains largely unexplored. This paper describes SIBs and their potential application to health-care initiatives in South-East Asia, with a focus on their potential contribution to universal health care.

WHAT IS A SOCIAL IMPACT BOND?

A SIB is an innovation in the way social services are contracted, financed and delivered, which has the potential to dramatically improve societal outcomes through the involvement of private capital. Unlike traditional government contracts, where governments must provide up-front funding, in a SIB, private investors provide the needed capital. A typical SIB contract requires that the government repays these investors, with a return on their investment, only if those providers successfully achieve an agreed-upon outcome. For example, instead of paying an organization providing health-care services based on how many individuals go through its programme, the contract would trigger a repayment only if there was a resulting improvement in health. This innovative approach ensures that government funds are spent only on social programmes that succeed. While investors in SIBs may receive an investment return from the government, they also take on the financial risk, as they typically stand to lose a portion of their investment if social outcomes do not improve. The rate of return varies, depending on the level of risk the investor chooses to assume, and the higher the guarantee they receive on their investment, the lower the rate of return will be. An independent evaluator validates the result with a rigorous analysis, such as a randomized controlled trial.

SIBs are receiving increasing attention worldwide, as a novel tool with the ability to reform and improve social services. The first SIB was created in the United Kingdom of Great Britain and Northern Ireland (UK) in 2010. Since then, at least two dozen local, state and national governments have started designing SIBs in Australia, Canada, Israel, the United States of America (USA), the UK and elsewhere. In the UK and the USA, where SIBs have received the most attention, governments have started designing supporting institutions for SIBs. President Barack Obama has proposed allotting nearly US$ 500 million of the fiscal year 2014 budget for the US Government to facilitate the creation of pay-for-success contracts. The UK Cabinet Office has created the Centre for Social Impact Bonds to educate and assist SIB designers. SIBs hold promise for creating alignment among government agencies, private investors and non-profit organizations,
to improve the outcomes of overburdened and resource-constrained governmental social service programmes. The SIB accomplishes this by (i) establishing clear rewards for investors, in return for providing risk capital; (ii) providing unambiguous metrics that align each stakeholder to the same outcome; and (iii) establishing a contractual framework that allocates shared responsibilities and clear expectations among the parties involved. Successful SIBs are designed to provide valuable benefits for all participants, including creating sustainable multi-year funding for effective non-profit service organizations; delivering increased and improved social services to disadvantaged individuals and communities; building accountability into government-sponsored programmes; improving outcomes for overburdened government social service agencies; and generating social, and potentially financial, returns for investors.

Liebman (2011) suggests that successful SIBs must have the following characteristics:4

(i) be a political priority, with a strong commitment from government champions;
(ii) have a measurable outcome, with credible outcome metrics that generate incentives that induce the right behaviour from the service provider;
(iii) have a reasonable time horizon between service delivery and observable outcomes;
(iv) be evidence based, as investors must have confidence that an established, reputable organization will deliver an effective, evidence-based intervention. To the extent that existing evidence fails to convince investors of the likelihood of success, they will demand higher premiums to offset higher risk;
(v) have a high social return, as SIBs are a cost-effective but expensive way to finance a social programme. Social returns must be sufficiently high to warrant the cost of capital and cost of structuring.

THE ROLES OF THE DIFFERENT PARTIES COOPERATING IN A SOCIAL IMPACT BOND PROGRAMME

A SIB programme is usually created with the assistance of an intermediary organization. This organization’s role is to: (i) establish a relationship between the government, the service provider or set of providers, the investors, and the independent evaluators; (ii) bid on and receive pay-for-success contracts issued by the government; (iii) identify investors, government officials and service providers, and educate them about the pay-for-success contract programme; (iv) evaluate service providers for their services’ applicability to the pay-for-success contract programme; and (v) negotiate and establish relationships with service providers, for the purpose of applying to pay-for-success contracts issued by the government.

An intermediary like Instiglio is responsible for designing and implementing the SIB funding model. Working with the various stakeholders, it advises on key design choices, including defining the social outcome, setting reasonable targets and creating the right metrics to evaluate impact. It also manages the stakeholder engagement and contract-building process, designing the funding model, and channelling up-front financing from investors to the service provider.

A service provider is an organization that operates a social service programme through a pay-for-success contract. Having received financing from investors, the service provider works with the intermediary and the government to create and deliver reports on programme outcomes. Service providers may be non-profit or for-profit organizations, although most previous service providers that have operated through pay-for-success contracts have been non-profit organizations. The service provider may be a set of different non-profit organizations that collectively provide a set of services through a pay-for-success contract.

An evaluator is an organization that is competent in conducting evaluations of social programmes and is independent in its interests and affiliations from the government, the service providers and the intermediary. The government is one or several government agencies that are involved in the identification of the right intervention and the design and negotiation of the pay-for-success contract around that intervention, and responsible for disbursing the payment to the intermediary in the event that its services achieve predetermined outcomes.

Investors may be individuals, foundations or financial institutions. These investors make project-specific investments in a special-purpose vehicle created for such investment. They receive from this vehicle their investment principal plus predetermined interest, often contingent upon the achievement of certain outcome goals. For some investors, the predetermined interest is zero, and their investment counts as a donation. For other investors, predetermined interests are greater than zero, and their investment yields returns. The rate of return is contingent on the level of capital guarantee negotiated between the investor and the outcome payer. A higher guarantee mitigates the risk assumed by the investor but lowers the expected rate of return. Because the contract pays only for success, in the event of a non-performance, investors may lose part of their investment. Service providers are for-profit or non-profit organizations that will be delivering social services to the population defined in the pay-for-success contract.

WHAT IS THE VALUE OF A SOCIAL IMPACT BOND?

SIBs fit into a broader family of pay-for-performance and results-based financing schemes, which have shown past success in addressing social problems in international development. Existing programmes that link funding to results take a variety of forms, from official development aid paying governments directly for high-level outcomes achieved (“results-based aid” or RBA), to paying service providers for completing a series of activities or outputs (“results-based finance” or RBF).5 These programmes are also known as performance-based aid and performance-based finance, respectively.

SIBs are distinct from current initiatives in at least four ways:
(i) they involve private-sector investment to solve a prefinancing gap. This broadens participation, by enabling service providers who may not have access to the initial capital otherwise to participate;

(ii) they can generally transfer more performance risk. This allows governments to write more high-powered performance contracts with providers;

(iii) their structure focuses on outcomes, such as decreased incidence of disease, rather than outputs, such as the number of vaccinations provided;

(iv) they focus attention on the relationship between a donor, government and service provider.

Because of their inherent structure, SIBs address two potential problems with existing RBF and RBA schemes. The first is uncertainty about the source of up-front funding for interventions, especially where governments or agencies have limited resources. The second is the concern that the service providers or recipient governments will be unable to bear implementation risk, or the risk that the funded interventions do not deliver the desired impact. This latter barrier is especially important for expanding promising interventions that have not yet been implemented or researched at scale. Additionally, as noted in a recent Social Finance UK report, SIBS also have “enormous potential to serve as a platform for development cooperation – an instrument that brings together the best of the private sector, civil society organizations, and donors and provides a way to enhance coordination among them”.

A SIB contains characteristics similar to those found in the Global Alliance for Vaccines and Immunization (the “GAVI Alliance”). The GAVI Alliance was created in 2000 to increase access to immunization for children in developing countries. In 2006, with the creation of the International Finance Facility for Immunization (IFFIm), the GAVI Alliance created an innovative financing mechanism whereby it issues “vaccine bonds” on international capital markets, backed by the long-term expected contributions from nine donor governments. Like in a SIB, the use of these bonds allows for the conversion of pledges, or future funding, into present-day cash reserves, allowing the GAVI Alliance to nearly double its funding for immunization programmes. The GAVI Alliance uses the proceeds from these bonds to negotiate purchasing and distribution agreements with major manufacturers and distributors of a select number of vaccines, in addition to other programmes that strengthen health systems worldwide.

Similarly, although SIBs may not increase the total amount of funding available in the health-care system, they may introduce a new source of funding. The SIB allows service providers, such as clinics and health-care facilities, to access private investment capital to fund operations over the duration of a programme. Investors would lend, in expectation of payment from the government once the service provider delivers successful outcomes. Such access to large amounts of up-front funding may be especially valuable to small health-care providers, who may otherwise have limited access to private capital.

**CHALLENGES TO UNIVERSAL HEALTH CARE IN SOUTH-EAST ASIA**

Despite pledging commitments to establish universal health coverage, countries of South-East Asia suffer low public expenditure on health, high rates of out-of-pocket (OOP) expenditure, and highly unequal health outcomes. Countries in the region spend less on health, both as a share of gross domestic product and per capita, than countries at similar levels of development. Indeed, in Indonesia, Lao People’s Democratic Republic and Cambodia, total health expenditure is below the minimum US$ 49–54 per capita estimated to be necessary to meet the Millennium Development Goals. Low public spending correlates with the predominant role of private expenditure in financing health care in the region. On average, 70% of total health expenditure is in the form of OOP payments, leading to a large proportion of households facing catastrophic health expenditure, defined as spending more than 10% of total consumption expenditure on health. The result is large and persistent inequalities in health outcomes across income groups and geographical areas. In some countries, such as China, there is evidence that rural–urban inequalities have increased.

There are three main impediments to the successful implementation of universal health care in South-East Asia. First, sources of inefficiency limit the availability of public-sector resources for health care. In particular, a lack of contract selectivity and evaluation, and an overreliance on fee-for-service payments generate perverse incentives. Service providers are not held accountable for outcomes and are rewarded based on inputs, leading to cost escalation and a lack of responsiveness to patient needs. Additionally, service packages funded under universal coverage schemes tend to be influenced by political and social factors, rather than considerations of allocative efficiency, leading to a concentration of resources in treatment, rather than preventive, services; tertiary care centres; and urban health facilities.

Second, limited government revenues mean that the most common financing approach for health care is compulsory social insurance programmes for employees. In many countries, this creates problems of coverage for the majority of the population that makes up the informal sector, and also for the poor and vulnerable. In Thailand, the Philippines and Viet Nam, subsidized voluntary health insurance schemes targeted at informal-sector groups have had limited take-up. Tax-financed targeted health schemes for the poor have generally suffered from a lack of funding, affecting the breadth and depth of coverage. For example, Indonesia’s targeted scheme provided a per capita government subsidy of only US$ 6 per year for a package of outpatient and inpatient services, resulting in low-quality provision and low utilization.

Finally, social health insurance schemes commonly provide only limited financial protection, necessitating high rates of OOP payments, which further prevent access to poor groups. For example, under the Philippine Health Insurance Corporation (PhilHealth) compulsory scheme, outpatient services are not covered and inpatient care is only partially reimbursed, so that patients must pay additional bills beyond
the level of reimbursement. This is even the case in high-income countries. In the Republic of Korea, co-payments and deductibles account for 20% of expenditures for inpatient care and 30–55% of outpatient care.

**USING SOCIAL IMPACT BONDS TO ADVANCE UNIVERSAL HEALTH CARE IN SOUTH-EAST ASIA**

Although SIBs are not a panacea, they have the potential to become one among several useful tools to advance universal health care throughout South-East Asia.

As already described, a major barrier to the expansion of universal health care in South-East Asia is the cost-effectiveness of services and the inefficiency of service provision. The concept of efficiency in health-care provision can be separated into allocative, technical and dynamic efficiency. Allocative efficiency considers whether every additional dollar is invested in the optimal way – for example, for treatment versus prevention. Technical efficiency asks whether a combination of money, doctors and medicine simultaneously minimizes costs and maximizes outcomes for a given procedure. Dynamic efficiency asks whether the rate of change in the health-care system is optimal. SIBs hold potential for improving all three types of efficiency.

SIBs can increase allocative efficiency by motivating the transition of a health-care system from treatment to prevention. Many acute health-care conditions, such as HIV, are far cheaper to prevent than to treat. Yet, overburdened health-care systems that may be interested in preventing the conditions they treat struggle to find additional financing to facilitate that transition. Through a SIB, a health-care ministry can create a contract to increase prevention of a costly ailment, and pay for that service from the expected reduction in resulting treatment costs.

SIB contracts emphasizing the achievement of outcomes can also improve technical efficiency, to motivate a health-care provider to better allocate existing resources within a particular intervention to improve outcomes. For example, health-care providers that receive capitation payments, as in Thailand, face incentives to minimize cost per reimbursed procedure. As such, a health-care system may motivate providers to transition towards more effective procedures, by changing capitation levels between procedures. SIBs offer a mechanism for a health-care system that would incentivize providers not only to minimize costs, but also to maximize outcomes. For example, the New York Medicaid Program in the USA has recently explored a pay-for-performance scheme to reduce the number of hospital readmissions. In this scheme, hospitals with higher case-mix-adjusted readmission rates receive lower capitation payments. If these payments offset revenue loss from having fewer patients and a potential increase in per-patient cost of treatment, then they may motivate hospitals to use evidence-based readmission-reduction interventions, such as the use of in-hospital patient advocates.

In theory, SIBs would motivate health-care providers to create innovative allocations of money, personnel and other resources, for the purpose of improving technical efficiency and thereby improving health-care outcomes. However, the exact level of innovation a SIB would create remains to be seen. On the one hand, health-care providers would face a financial incentive to experiment with new delivery systems, because better delivery systems would improve outcomes and thereby increase the outcomes-based payment to the health-care providers. On the other hand, health-care providers face a financial disincentive to stray too far from proven delivery systems, because a failure to deliver health-care outcomes would reduce the outcomes-based payment that they receive.

It is too early to tell for certain whether SIBs can make a significant improvement in the dynamic efficiency of the health-care system. The ability of SIBs to improve dynamic efficiency may be increased if they are designed within a broader initiative that funds the discovery of effective health-care interventions. The partnership between private investors and health-care providers may improve the quality of the providers’ performance management systems and thereby increase the rate of learning for the provider.

A further advantage of applying the results-based SIB model to health care in South-East Asia is that it may increase coverage and service utilization for the informal sector and low-income groups. The results-driven framework of SIBs, as well as their long-term focus, makes them effective in improving service quality and, as a consequence, utilization rates. Additionally, SIBs may be used to directly incentivize the utilization of services by beneficiaries.

Numerous studies show that the poor quality of health-care services is a major determinant of low utilization rates such as those seen in South-East Asia. For example, in a review of performance-based health care, the German Society for International Cooperation noted that perceived quality is an important determinant of health-care utilization – indeed, that “often the women themselves opt against delivering in a health facility due to either the poor quality of services, financial barriers, the lack of information on the risks of motherhood, or the prevailing traditional norms”. Similarly, a comparative review of studies of maternal health care in the developing world has found that perceived quality of care can be, depending on the context, a key determinant of utilization.

As such, if a SIB funds a successful health-care service, an evaluation shows that the service generated successful health-care outcomes, and potential patients who might demand that service perceive that the SIB generated a higher-quality result, the utilization of that service may potentially increase. This is aided by the fact that SIBs typically include a rigorous evaluation, such as a randomized controlled trial, that helps the government determine whether the outcome for which it is paying was created by the programme or by chance. Studies have shown that supply-side RBF schemes can also improve the quality of services, which, in turn, increases utilization.

In addition to increasing quality, the available evidence suggests that SIBs can also help increase health-care coverage. Strong evidence exists that utilization rates increase dramatically with voucher schemes incentivizing the utilization of maternal, newborn and child health-care services,
as well as the proportion of women using antenatal and postnatal care services, and whose deliveries are assisted by trained providers. A World Bank-funded comparative review of performance-based and non-performance-based health schemes in the Butare, Cyangugu, Gikongoro and Kibungo provinces of Rwanda found that provinces with performance-based financing (PBF) showed the largest increases in curative and preventive services. For example, PBF-based schemes demonstrated an 11% increase in measles coverage, while non-PBF-based schemes showed an increase of just 1%. Similarly, PBF-based schemes demonstrated an increase of institutional deliveries of almost 11% between 2001 and 2004, while non-PBF schemes showed an increase of just 3%. Innovative strategies introduced under PBF-based schemes included “the establishment of additional centers to bring services closer to beneficiaries, paying traditional birth attendants to bring women to health centers, and providing clothing for newborns as an incentive to attract women to deliver”.

Finally, SIBs may be effective in reducing the high levels of OOP expenditure that characterize health-system financing in South-East Asia. A quasi-experimental evaluation of the Rwanda results-based financing scheme shows that consumers paid less OOP in the RBF clinics than in non-RBF clinics. In that scheme, payments to health-care facilities by the government were conditional on the quantity of health care delivered. Health-care providers may have been motivated to reduce charges to prospective patients to increase utilization. This suggests that SIBs that include output metrics in the basis of payment to providers may similarly motivate providers to reduce OOP fees, while having the additional benefit of transferring the financial risk of non-delivery to private investors.

As such, SIBs and other results-based finance programmes may improve process and output parameters such as utilization and coverage, care quality, and equity. However, the lack of robust health-outcome data, the variability of programme design, and the nascent stage of many RBF programmes necessitates that attention be paid to the specific contexts and modes of implementation for each programme.

Although SIBs hold promise for enabling the improvements described above, this innovation is unlikely to address other barriers to implementing universal health-care initiatives in South-East Asia, such as low public revenue. Although SIBs may introduce a new source of funding, they are unlikely to increase drastically the amount of funding available for expanding health care. Thus, SIBs should be viewed as one of a number of useful tools to usher in universal health care in South-East Asia.

CHALLENGES OF CREATING A SIB

This section notes three main challenges that designers of a health-care SIB in South-East Asia are likely to face. First, SIB designers will have to find ways to reduce the up-front cost of creating a SIB. Initial SIB pilots have been shown to be significantly more expensive than the cost of service delivery alone, for two reasons. First, in a SIB, government or donors pay a premium above the cost of service delivery, for the certainty that the outcome has been delivered. Second, SIB designers will probably need outside advice. Governments in low- and middle-income countries have needed outside advice to understand how their procurement systems and existing contract types can be used to create a SIB. Some governments in high-income countries have resolved these problems by hiring outside legal counsel and bypassing legislation. Others have hired additional staff to focus on SIB design.

A second, and related, challenge is that SIB designers will have to find ways to reduce the duration and complexity of up-front work, such as legal assistance in drafting a novel type of contract, and the cost of performance monitoring by an intermediary. Some governments have overcome high costs of initial pilots by obtaining pro bono services from outside experts, by sharing the cost burden with other government agencies, and by receiving financial support from foundations and other outside sources of capital. Furthermore, observers expect up-front costs to decrease as the process for creating a SIB becomes more standardized.

Third, SIBs must be designed carefully to ensure that a health-care SIB does not motivate unwanted behaviour. For example, extrinsic motivation, such as that presented by monetary incentives provided to front-line health workers, may crowd out intrinsic motivation, such as an altruistic desire to help patients, personal values, and self-esteem. Ellingsen and Johannesson, for example, propose a principal-agent model, which argues that agents care about social esteem and value the approval of those whom they themselves approve of more. A principal’s decision to impose a controlling incentive scheme to induce better performance may have the inadvertent effect of affecting the agent’s assessment of the principal’s character, thus showing how “an incentive that in isolation would have a positive effect on the agent’s behavior has a negative effect...because of what the incentive tells the agent about the principal”. One review found that in low- and middle-income countries, “financial incentives may lead to demoralization, reductions in intrinsic motivation, less trust between patients and providers”, and may decrease the quality of the health-care workforce in the long run, by selecting against those individuals who are intrinsically motivated to perform well.

Health-care SIBs should be designed to maximize the overall motivation of health-care workers in the long run. SIB designers could involve workers in designing incentives to balance their extrinsic and intrinsic motivation. Designers may include components that signal support for high-performing workers, as studies show that this increases motivation. Failure to design incentive structures well may increase the cost per unit of outcome, relative to a comparison group where intrinsic motivation exists.

SIBs must also be carefully designed, so as to ensure that evaluation systems are not gamed. In some cases, performance awards for specific outputs may cause front-line health workers to re-optimize services in a way that maximizes those outputs but reduces, or does not improve, the overall health outcomes of patients. When an individual is responsible for multiple tasks, the literature on “multitasking” suggests that rewarding
one task leads to a reduction in effort towards other tasks that are not similarly incentivized. For example, one study in Kenya found that rewarding decreases in malnutrition rates in schools led to a 15% decrease in teaching time, while another study in China found that incentivizing reduced student anaemia may have led to reduced teaching effort, and, in some cases, lower test scores. At the same time, when multiple outcomes are incentivized, providers may focus effort on outcomes that are considered easier to achieve, with the highest marginal return. For example, in Rwanda, performance incentives were “more effective in increasing institutional delivery rates among pregnant women who were already in contact with community health workers”, than in the harder task of initiating prenatal care with women who did not use the health-care system, especially because the payment for increasing institutional deliveries was much higher than that for increasing prenatal care visits. Unintended consequences of incentivizing good patient outcomes can also extend to “cherry picking”, where providers only choose to serve patients who are the healthiest or the easiest to treat, as opposed to those who are very sick or located in very remote areas.

Incentivizing specific services may also lead to inadvertent side-effects, such as motivating the falsification of performance-evaluation sheets. In one scheme in India, when a programme started paying staff more for delivering babies after office hours, the number of night-time deliveries suddenly and sharply increased, indicating that staff probably falsified data to get additional payments.

Poor design of initial SIBs may lead not only to suboptimal outcomes in the SIB programme, but also to unwillingness from the government to pursue additional SIBs. This concern is especially strong if poor design leads to public perception that providers in the SIB are “teaching to the test”, to maximize government payments.

**CONCLUSION**

SIBs may become one among several useful tools in advancing universal health care throughout South-East Asia. Studies have shown that chosen indicators that are incentivized in other RBF programmes show “significant improvement”, suggesting that health-care interventions could also benefit from SIBs.

There is initial evidence that SIBs may contribute to increased health-care coverage by decreasing OOP expenditure – a major barrier to the utilization of health-care services by the poor, and hold promise for creating interest alignment among government agencies, private investors and non-profit organizations, to improve the outcomes of overburdened and resource-constrained social service programmes.

SIBs are not a panacea, however, but they can help address some of the barriers to implementing a universal health-care system in the region. For example, a major barrier to the expansion of universal health care in South-East Asia is the cost-effectiveness of services and the inefficiency of service provision. SIBs can help expand health care by addressing this fundamental problem. Although SIBs may not increase the total amount of funding available in the health-care system, they may introduce a new source of funding.

The potential for SIBs to improve the efficiency, quality and equity of health services merits further exploration of this innovative funding mechanism. Governments in South-East Asia should consider the implementation of further pilots to test this model, as a means towards the goal of improving health-care coverage.

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Original research

Measuring universal health coverage: a three-dimensional composite approach from Bhutan

Jayendra Sharma,1 Kado Zangpo,1 John Grundy2

ABSTRACT

Background: In the early 1960s, the Kingdom of Bhutan began to develop its modern health-care system and by the 1990s had developed an extensive network of health-care facilities. These developments, in tandem with wider social and economic progress encapsulated in the Gross National Happiness concept, have resulted in major gains in child survival and life expectancy in the past 50 years. In order to sustain these gains, the country has identified a constitutional and health-policy mandate for universal access to health.

Methods: Based on analysis of the literature, and qualitative and quantitative health data, this case study aims to provide an assessment of universal health coverage in Bhutan, and to identify the major challenges to measuring, monitoring and sustaining universal coverage.

Results: The study reveals that the wide network of primary and secondary care, reinforced by constitutional and policy mandates, ensures high population coverage, as well as wide availability and accessibility of care, with significant levels of financial protection. This achievement has been attributable to sustained state investment in the sector over past decades. Despite this achievement, recent surveys have demonstrated gaps in utilization of health services and confirmed associations between socioeconomic variables and health access and outcomes, which raise important questions relating to both supply- and demand-side barriers in accessing health care.

Conclusion: In order to sustain and improve the quality of universal health coverage, improved measurements of service availability at subnational levels and of the determinants of pockets of low service utilization are required. More rigorous monitoring of financial protection is also needed, particularly in relation to rates of public investment and the impact of out-of-pocket costs while accessing care. These approaches should assist improvements in quality and equity in universal health coverage, in the context of ongoing epidemiological, demographic and social transition.

Key words: Bhutan, universal health coverage, UHC, measuring universal health coverage, health policy

INTRODUCTION

The contextual background to universal health coverage in Bhutan

The Kingdom of Bhutan (population 720 679)1 is bordered between China and India, with three distinct regions comprising high mountain ranges contiguous with the Tibetan plateau, deep hills and valleys, and southern semi-tropical regions. In recent years, Bhutan, a primarily agricultural society and economy, has experienced rapid economic growth and transformation. Secondary and service sectors (particularly hydroelectricity and construction) have now become the main driving forces of the economy, with the share of gross domestic product (GDP) from these sectors now as high as 40%.1 In recent decades, along with democratic political reforms and expanding trade
and commerce, there has been increased exposure of the country to outside influences of migration, education and tourism.

Along with these social changes, Bhutan is now proceeding through a period of epidemiological and demographic transition. A recently completed global burden of disease study established that, between 1970 and 2010, Bhutan was at the top of the range globally for changes in life expectancy, with gains of 23–29 years in this period. Total fertility rate declined from 3.8 in 2000 to 2.6 in 2009. Bhutan is also rapidly urbanizing, with 36% of the population in urban areas in 2009, compared with just 25% in 2001. In the past 50 years, infant mortality has more than halved, and the number of malaria cases has declined from a reported 5935 in 2000 to 194 in 2011. Between 1990 and 2010, the mortality rate for children aged under 5 years declined from 162 to 61 per 1000 live births (see Figure 1).

The modern Bhutanese health system has gradually developed since the 1960s, with the country having only 2 hospitals and 11 dispensaries in 1961. Bhutan became a signatory to the Declaration of Alma-Ata on primary health care in 1978, after which there has been sustained public investment to develop the system. By 1985, there were 16 district hospitals and 50 primary care basic health units. By 2008, facility numbers had grown to 31 hospitals (district and regional) and 178 basic health units, staffed with 171 doctors and 567 nurses. Table 1 outlines the current status of health and development indicators in Bhutan from the Gross National Happiness (GNH) index (a single number index developed from 33 indicators categorized under nine domains, including the specific health measures that are included in Table 1).

Health systems and policies in Bhutan

Health care in Bhutan is overwhelmingly public. All mainstream health services are provided by the government and are free of charge at the point of use. There is no legal framework for operation of the private medical sector in Bhutan. Private-sector engagement in health care is limited to private diagnostic centres (catering mostly for screening of foreign workers) and private retail pharmacies in major district towns. Government resources fund around 80% of the health spending in the country. The remaining funding comprises user charges for selected cosmetic and dental services, out-of-hours services in public facilities, private insurance, and indirect expenses related to health care.

The health-delivery framework runs on a three-tiered system. At the primary level of care, there is a system of basic health units (2 levels) staffed by nurses and midwives and with wide population reach, extended by a system of outreach clinics. At the secondary level of care, there is a network of district hospitals managed through the dzongkhag (district) level of local administration, but technically advised and supported by the central Ministry of Health. The tertiary level of care is provided through a network of three regional referral hospitals, including the national referral hospital, which provide

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**Figure 1:** Declines in mortality in infants and children aged under 5 years, 1984–2005

specialized medical and surgical care services. Patients are referred outside Bhutan for specialist health services not available in the country, with the costs of care funded by the Royal Government of Bhutan (RGoB). Traditional health-care services are integrated into the modern health-care system at all levels of care.\textsuperscript{11} Overall health strategy is guided by the national development approach of GNH, which seeks to promote a balanced approach to human development by emphasizing the non-economic aspects of social well-being.

In terms of mandates for universal health coverage (UHC), the Constitution of the Kingdom of Bhutan, and the National Health Policy, guarantee that the state will provide free access to basic public health services in both modern and traditional medicines.\textsuperscript{12}

Based on these observations, the following questions are raised in this case study; what is the current status of UHC in Bhutan, and what are the main gaps in measurement and the recommended strategies to address them?

### Analytical frameworks for measurement of universal health coverage

The framework for analysis of UHC by the World Health Organization (WHO) identifies the three dimensions of measurement, including population coverage, service availability and financial protection.\textsuperscript{13} Population coverage measures the percentage of population reached by the services, service availability measures the scope of services that can be provided, and financial protection measures the extent to which the population is protected from the financial hardship of accessing needed health care.

In an assessment of UHC in the WHO Western Pacific Region, data sourced from expenditure surveys in six countries of Asia were analysed to make cross-country comparisons of utilization of health-care services and monthly household expenditures on health.\textsuperscript{14} Similar methods have been applied in both Cambodia and Lao People’s Democratic Republic, to monitor national improvements towards UHC.\textsuperscript{15,16}

The limitations of all these approaches in the context of Bhutan relate to the challenge of understanding the multiple determinants of low utilization of certain services (e.g. poor utilization despite widespread availability of maternal care services), including accounting for socioeconomic and regional inequities of access and outcomes. The multiple determinants of these outcomes will require a much deeper and multifaceted causality analysis. The analytic framework of Tanahashi\textsuperscript{17} is highly informative in uncovering these additional “sub-dimensions” for population coverage and service availability. Therefore, although the WHO framework of “dimensions of coverage” is used to broadly classify measures of UHC, the Tanahashi perspective of accessibility and acceptability coverage is also applied, in order to reflect the deeper concerns regarding the reasons for the pockets of lower coverage in areas of Bhutan.

Several “yardsticks” were identified for setting benchmarks for how to measure UHC in Bhutan. The first was the monitoring and evaluation framework for the Eleventh Five Year Plan 2013–2018.\textsuperscript{18} This multi-year plan has identified over 100 indicators of impact, outcome and health-system outputs, with identifiable baseline measures from population-based surveys, the Bhutan Health Management Information System (BHMIS), and project management systems. A working guide on essential packages for health-care services was also developed, to

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**Table 1: Development indicators: Bhutan**

<table>
<thead>
<tr>
<th>Health and social indicators</th>
<th>Value</th>
<th>Year</th>
</tr>
</thead>
<tbody>
<tr>
<td>GDP per capita (Nu)</td>
<td>138,132 (US$ 2300)</td>
<td>2012</td>
</tr>
<tr>
<td>Population poverty rate (%)</td>
<td>12</td>
<td>2012</td>
</tr>
<tr>
<td>Gini-coefficient</td>
<td>0.36</td>
<td>2012</td>
</tr>
<tr>
<td>Adult literacy rate (%)</td>
<td>63</td>
<td>2012</td>
</tr>
<tr>
<td>Youth literacy rate (%)</td>
<td>86.1</td>
<td>2012</td>
</tr>
<tr>
<td>Population growth rate (%)</td>
<td>1.3</td>
<td>2012</td>
</tr>
<tr>
<td>Infant mortality rate (per 1000)</td>
<td>47</td>
<td>2010</td>
</tr>
<tr>
<td>Under-five mortality rate (per 1000)</td>
<td>69</td>
<td>2010</td>
</tr>
<tr>
<td>Self-rated health status “excellent” or “very good” (%)</td>
<td>71.8</td>
<td>2010</td>
</tr>
<tr>
<td>Satisfied and very satisfied with health-care services (%)</td>
<td>93.1</td>
<td>2010</td>
</tr>
<tr>
<td>Mean walking time to health facilities in rural areas (minutes)</td>
<td>92.8</td>
<td>2010</td>
</tr>
</tbody>
</table>

GDP: gross domestic product.
Nu: Ngultrum, Bhutanese currency.
provide some benchmark against which to measure the scope of service provision.

This case study of UHC measurement in Bhutan seeks to contribute to the national and international discourse on this subject, through description of a practical experience in measurement of universal cover in the context of a country on a well-established pathway to UHC. The specific objectives of this case study are to (i) identify current specific gaps in the measurement of UHC, (ii) provide a preliminary assessment of the status of UHC in Bhutan, and (iii) recommend concepts and strategies and next steps for improving measurements of UHC.

**METHODS**

**Data collection**

Data were collected and analysed through review of health information and existing survey results at the Policy and Planning Division of the Ministry of Health. The grey literature in Bhutan was reviewed, by referring to population health surveys conducted within the past 5 years, as well as a recent health-sector review, national health accounts data, health information analyses, and a health-system gap analysis and resource mobilization exercise conducted in 2012. Use of the title search term “Bhutan” in PubMed retrieved 115 peer-reviewed articles published up to May 2013. More than half of these published articles were related to communicable diseases. Only 10 of these articles (8% of total) were health-systems related, some of which are referenced in this paper. This search has therefore identified important gaps in the peer-reviewed literature on health-systems evolution in Bhutan, as well as provided some limited additional historical and public health data to complement data from the health management information systems and grey literature sources located in Bhutan.

Sources of quantitative data (see Table 2) included the database of the Bhutan Health Management Information System (BHMIS), which provides an overall picture, disaggregated to primary health-care facility level, of the International statistical classification of diseases and related health problems (ICD-10), outpatient’s data, and coverage reporting for priority interventions. Epidemiological and demographic data were also sourced from a central database of annual household surveys conducted across the country by staff of basic health units.

Open-ended interviews/consultations (n = 20) were undertaken with health managers in the central Ministry of Health, on current data-collection methods and current sources and information gaps for UHC, and with middle-level managers in two districts and primary care providers in two health centres (Paro District and Punakha District). In these interviews, three broad questions were addressed in an open question line, to address the main objectives of the study: what are the gaps in coverage, how is it known these gaps exist, and what needs to be done to address gaps in both information and coverage?

**Data analysis**

For the mapping of data sources, an Excel spreadsheet was prepared, which mapped sources of data according to each UHC dimension. Where data gaps became evident through this mapping or through analysis of data in the BHMIS, additional information was sourced through the grey literature and interviews. A list of 100 indicators in the Eleventh Five year Plan was shortened to a list of 15 for the UHC assessment (see Table 4), based on the criteria of (i) inclusion within the current national Five Year Plan 2013–2018, (ii) the degree to which they were specific to the measurement of the three dimensions of UHC, and (iii) the capacity to use the indicator to assess UHC at subnational level. The shortlist was generated based on planners’ assessment of those indicators that can best act as proxy for subdimensions of coverage, including availability.

Table 2: Data sources and description

<table>
<thead>
<tr>
<th>Sources of data</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bhutan Health Management Information System (BHMIS) database</td>
<td>This database provided information on disease reporting, health-facility utilization and health management information by district (dzongkhag). Indicators from the UHC index are sourced from this system.</td>
</tr>
<tr>
<td>Dzongkhag health profiles</td>
<td>This information is collected by staff of basic health units annually and is collated at district level. It provides basic health, financing and demographic information at the primary level of care, and complements the data collected through the BHMIS.</td>
</tr>
<tr>
<td>Health sector gap analysis</td>
<td>This literature review provided information on current strengths and weaknesses by health-system building blocks.</td>
</tr>
<tr>
<td>National Health Accounts</td>
<td>This report provides information on sources of expenditure and trends in health expenditures in the health sector.</td>
</tr>
<tr>
<td>Health policy and planning grey literature</td>
<td>This literature, collected through the Policy and Planning Division at the Ministry of Health in Thimphu provided information on planning objectives, strategies and targets, including current policy formulation.</td>
</tr>
<tr>
<td>International peer-reviewed literature</td>
<td>As outlined in the methods section, this information provided background on the health system in Bhutan, as well as information on the current concept of universal health coverage.</td>
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</tbody>
</table>
accessibility and utilization. The indicators selected were those that were assessed to be most specific to measurement of UHC.

A UHC index was then created through allocation of weightings to indicators. All indicators were apportioned an equal weighting, except for the following three:

- utilization of outpatient departments (OPDs) – given a higher priority, as it represents a reasonable measure of population confidence in use of the services;
- measurement of health services availability – given a higher weighting, as it will provide an aggregate of a number of measures of health-service delivery;
- the presence of a UHC policy – also given a higher weighting, as it is a necessary condition for sustainability of UHC.

The different weightings were arrived at through assessment by planners of the degree to which the specific indicator can make a contribution to the achievement of the policy goals of UHC. For example, the development of UHC policy was accorded a higher weighting, because of the recognized role of political commitment (through policy) in stewardship and mobilizing resources to achieve the UHC goals. OPD contacts was provided a higher weighting, because of the capacity of this indicator to assess trends in utilization for a wide range of services, rather than for programme-specific services (such as for antenatal care and coverage of diphtheria–pertussis–tetanus [DPT3] vaccination, for example, which have lower weighting).

Index scores were arrived at by multiplication of the weighting by the most recent coverage assessment for the specific indicator (for example antenatal care coverage has an index result of 0.77, based on a weighting of 1 for this indicator and the most recent administrative coverage report of 77%).

### RESULTS

#### Assessment of population coverage

In terms of national health coverage for priority health interventions, Bhutan has demonstrated an impressive track record in coverage, with steady improvements in access to maternal and child health-care services and outcomes since the early 1990s (see Figure 1).

Immunization coverage for DPT3 was 96% nationwide in 2010, and delivery by trained health professionals had increased to 70% in 2010. Improved population coverage for such primary health-care interventions has, without doubt, been a major contributing factor to the declines in infant and child mortality since the early 1990s as can be seen in Figure 1.

Between 2009 and 2011, per capita OPD consultations ranged from 3.17 to 3.14 visits nationally per year. There are limited data on standards for OPD contacts per inhabitant globally or regionally; however, the average across countries of the Organization for Economic Co-operation and Development (OECD) was reported as 5.6 visits per capita per year in 2003. Subnationally in Bhutan, as demonstrated by Figure 2, there is a wide variation in the pattern of utilization, with consultation contacts per capita ranging from just over two per inhabitant per year in Haa district to about five per year in Sarpang district.

There is also a wide variation in accessibility, with the proportion of population within 3 hours’ walking times to facilities ranging from 42% to 93% across districts. It should be noted, however, that these assessments may not take into account the recent development in roads and communications, which means that a much higher percentage of the population would have a shorter travelling time to health facilities by other means than walking.

In terms of acceptability of services, there is a limited demand-side research or information available identifying client perception of barriers to health-care access, particularly for maternal care. The GNH survey conducted in 2010 demonstrated a high level of satisfaction with services, with 93% of the population surveyed indicating they were either very satisfied or satisfied with the treatment they received. However, other population-based surveys demonstrate wide variations in the use of health facilities for delivery, according to both region and socioeconomic quintile (see Figure 3). The BHMIS data also demonstrate a wide variation in rates of delivery at a health facility between districts, with rates of less than 20% in western mountainous and high plateau regions of Haa and Gasa, demonstrating that there are some issues that are likely to relate to acceptability of services for maternal care. The most recent national estimate for institutional delivery is 66%. This gap in coverage would require further investigation, given that maternal deaths, though declining, are still widely reported in Bhutan. Variations in child health outcomes, too, are observable among different socioeconomic profiles (see Figure 4).

Existing data confirm associations between socioeconomic status and health access and outcomes. Consultations in the field indicated that delayed decision-making processes, owing to behavioural factors, poverty, lack of information, and lack of transport and communications, could be the factors contributing to lower utilization of services. It is not yet clear whether existing methods for UHC measurement are sufficiently sensitive or specific in identifying the causes of these utilization and equity gaps, especially in terms of whether they relate to factors of service quality, affordability (indirect costs), community traditions and perceptions, or a combination of these. Further research is required to pinpoint the determinants of these variations in access and outcomes, and to design interventions that are appropriate to the needs of the affected groups.

#### Assessment of service availability

The health-care system, including modern health-care infrastructure, started to develop in the 1950s and more prominently from the 1960s – with the initiation of the first Five Year Plan. The first hospital was established in 1956,
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Figure 2: Per capita consultation rates, by dzongkhag (district) 2010

Source: Royal Government of Bhutan, Ministry of Health. Bhutan health management information system. BHMIS Database.

Note: Thimphu district has been removed from this presentation, because of the limitation of the BHMIS, which does not have an integrated database for the national referral hospital located in Thimphu.

Figure 3: Delivery at facility, according to background characteristics of location and wealth

and in 1961 there were just two hospitals, two doctors and two nurses. Since that time, health-facility numbers have continued to expand at a steady rate (see Table 3), along with the introduction of outreach clinics to expand service reach to more remote populations.

An essential medicines list is maintained for each level of the health system. A health-sector review conducted in 2012 indicated that access to essential drugs has been over 90% in all facilities following resolution of a procurement crisis earlier in the year, which had resulted in stock-out of some essential medicines. Availability of human resources across dzongkhags demonstrates wide variation, while levelling out nationally at 2.3 professional health staff per 1000 population.

In terms of service availability of a specific package of services, the Quality Assurance and Standardization Division of the Ministry of Health has developed sets of clinical standards, although a management process for standards assessment has not been clearly defined. Nevertheless, based on existing data relating to supply and coverage of human resources, infrastructure and essential medicines, the proportion of facilities providing essential/standard package of services is estimated at 80% nationally. More accurate assessment will require the development and implementation of a management process and response procedure, to assess service availability across the country.

### Table 3: Growth in health infrastructure and health workforce 2001–2012

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Hospitals</td>
<td>29</td>
<td>29</td>
<td>30</td>
<td>31</td>
</tr>
<tr>
<td>Basic health units</td>
<td>168</td>
<td>176</td>
<td>181</td>
<td>181</td>
</tr>
<tr>
<td>Outreach clinics</td>
<td>461</td>
<td>485</td>
<td>518</td>
<td>518</td>
</tr>
<tr>
<td>Doctors</td>
<td>114</td>
<td>145</td>
<td>187</td>
<td>181</td>
</tr>
<tr>
<td>Health assistants</td>
<td>163</td>
<td>171</td>
<td>366</td>
<td>429</td>
</tr>
<tr>
<td>Nurses</td>
<td>569</td>
<td>538</td>
<td>556</td>
<td>723</td>
</tr>
<tr>
<td>Hospital beds (per 1000 population)</td>
<td>1.6</td>
<td>1.7</td>
<td>1.8</td>
<td>1.8</td>
</tr>
<tr>
<td>Nurses and midwives (per 1000 people)</td>
<td>—</td>
<td>0.24</td>
<td>—</td>
<td>0.98</td>
</tr>
<tr>
<td>Community health workers (per 1000 people)</td>
<td>—</td>
<td>0.20</td>
<td>—</td>
<td>0.85</td>
</tr>
</tbody>
</table>


Assessment of financial protection

Data at this time demonstrate low out-of-pocket expenditures, which is consistent with the policy of universal free health-care access in Bhutan. It has been estimated that 10.7% of total health expenditure is in the form of household out-of-pocket payments for health care.\textsuperscript{10} BHMIS data reveal that direct household expenditures for illness reported for a month ranged from below 100 Nu (1 US$ = 50 Nu) in southern Samdrup Jongkar district to over 5000 Nu in highland Gasa district. The fact that a recent population survey has demonstrated variations in health access and outcomes across regions and socioeconomic gradients\textsuperscript{23} would suggest the need for careful monitoring of out-of-pocket expenditures over the coming years. There is room for consolidation of the evidence and active monitoring of financial risk in health, through better evidence on incidences of catastrophic health expenditures and the incidences of impoverishment due to out-of-pocket health payments.

The other aspect of financial protection is sustained public health financing of the health sector. Government is the predominant source of funds for the Bhutanese health system, and contributes 88% of the total health expenditure of the country.\textsuperscript{10} In absolute terms, investment by the government has doubled between 2000 and 2010. Nevertheless, in terms of total expenditure on health as a percentage of GDP, there has been a decline from over 6% of GDP in 2000 to less than 4% of GDP in 2010 (see Figure 5). The share of government expenditure for health has also declined from 6.7% to 5.6% between the last two Five Year Plans, despite the significant increase in per capita expenditures on health that can be seen in Figure 5. This contrasts with one international norm, which states that low-income governments promoting UHC should aim to devote 15% of their total budgets to health.\textsuperscript{24} These trends in health financing raise questions regarding whether the decline is related to heavier infrastructure development in the early 2000s, or is relative to increases in overall GDP as a result of the rapid growth in private capital in Bhutan in recent years.\textsuperscript{7} These trends need to be monitored, in order to alert decision-makers of the determinants and risks of a declining share of GDP and government expenditure for health, in terms of sustaining the UHC policy, particularly in the context of rising health-care costs.

UHC index

Taking into account the above and related results of the UHC assessment, Table 4 provides a summary assessment of UHC in Bhutan, based on information provided in the previous sections and on an “index” analysis as described in the methods section.
Table 4: UHC Assessment Index: Bhutan

<table>
<thead>
<tr>
<th></th>
<th>Data source</th>
<th>Indicator result 2011</th>
<th>Weight</th>
<th>Score</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Population coverage</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Proportion of districts with DPT3 coverage &gt;80%</td>
<td>BHMIS 2011</td>
<td>19 out of 20 dzongkhags</td>
<td>1</td>
<td>0.90</td>
</tr>
<tr>
<td>% of pregnant women completing 4 antenatal care visits</td>
<td>BHMIS 2011</td>
<td>77</td>
<td>1</td>
<td>0.77</td>
</tr>
<tr>
<td>% of births in health facilities</td>
<td>BHMIS 2011</td>
<td>63</td>
<td>1</td>
<td>0.63</td>
</tr>
<tr>
<td>OPD contacts</td>
<td>BHMIS 2011</td>
<td>3.1 (if &gt;3 per capita = 2)</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>% of population living within 3 hours’ walk of health facility</td>
<td>BHMIS 2012</td>
<td>76</td>
<td>1</td>
<td>0.76</td>
</tr>
<tr>
<td>% of women aged 20–60 years who have undergone pap smear screening at least once</td>
<td>BHMIS 2011, Eleventh Five Year Plan\textsuperscript{18}</td>
<td>25</td>
<td>1</td>
<td>0.25</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td></td>
<td></td>
<td>7</td>
<td>5.31</td>
</tr>
<tr>
<td><strong>Result</strong></td>
<td></td>
<td></td>
<td></td>
<td>76%</td>
</tr>
<tr>
<td><strong>Service availability</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>% of facilities providing essential package according to standards</td>
<td>Estimate</td>
<td>80</td>
<td>5</td>
<td>4</td>
</tr>
<tr>
<td>Proportion of dzongkhags with &gt;2.3 staff per 1000 population</td>
<td>HRD database</td>
<td>8 out of 19 dzongkhags</td>
<td>1</td>
<td>0.42</td>
</tr>
<tr>
<td>Proportion of dzongkhags with no stock-out of essential drugs in last 12 months</td>
<td>BHMIS 2012</td>
<td>5 out of 19 dzongkhags</td>
<td>1</td>
<td>0.26</td>
</tr>
<tr>
<td>Patient satisfaction rate at facilities (%)</td>
<td>Eleventh Five Year Plan\textsuperscript{18}</td>
<td>85 with target of 95</td>
<td>1</td>
<td>0.85</td>
</tr>
<tr>
<td>National average OPD waiting time from 9 to 11 am</td>
<td>Eleventh Five Year Plan\textsuperscript{18}</td>
<td>Maintain at 23 minutes</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td></td>
<td></td>
<td>9</td>
<td>6.53</td>
</tr>
<tr>
<td><strong>Result</strong></td>
<td></td>
<td></td>
<td></td>
<td>73%</td>
</tr>
<tr>
<td><strong>Financial protection</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>% of non out-of-pocket expenditures on health</td>
<td>National Health Accounts [NHA] 2009–2010\textsuperscript{10}</td>
<td>NHA Estimate</td>
<td>1</td>
<td>0.91</td>
</tr>
<tr>
<td>% of nominal GDP allocated to health</td>
<td>National Health Accounts [NHA] 2009–2010\textsuperscript{10}</td>
<td>3.68 (target of 5)</td>
<td>1</td>
<td>0.74</td>
</tr>
<tr>
<td>Government health expenditure as % of total government expenditure</td>
<td>National Health Accounts [NHA] 2009–2010\textsuperscript{10}</td>
<td>5.6 (target of 8)</td>
<td>1</td>
<td>0.70</td>
</tr>
<tr>
<td>Constitutional/policy commitment to UHC</td>
<td>National Health Policy 2010\textsuperscript{12}</td>
<td>Yes</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td></td>
<td></td>
<td>5</td>
<td>4.35</td>
</tr>
<tr>
<td><strong>Result</strong></td>
<td></td>
<td></td>
<td></td>
<td>87%</td>
</tr>
</tbody>
</table>

BHMIS: Bhutan Health Management Information System.
HRD: Human Resources Division (Ministry of Health, Bhutan).
The respective index scores for the three dimensions of UHC represented by population coverage, services availability and financial protection are estimated at 76%, 73% and 87%, respectively.

**DISCUSSION**

Overall, the picture for UHC is positive in Bhutan, with generally high population coverage for most health programmes, and widespread service availability through the networked three-tiered health-care system, and with constitutional and health-policy mandates for universal access. This universal access has been translated into substantially improved health-care coverage and health outcomes, particularly in the past 25 years. All of these improvements have taken place in the context of rapid social and political transitions in the country, which is trending towards a more urbanized and economically robust society. Nevertheless, the evidence of variations in health access and outcomes from population-based surveys, and the pockets of low utilization for specific services across the country, indicates that there are a number of threats to and opportunities for sustaining and improving the quality of UHC in the Bhutanese context.

*Rapid economic growth* presents significant opportunities for UHC in terms of additional mobilization of resources for health through increased fiscal space. Double-digit economic growth was recorded in 2010, and the expansion of the hydropower sector in the coming years is expected to add significantly to government tax revenues. Nevertheless, this pace of growth presents threats too, particularly in terms of the potential for widening socioeconomic disparities as incomes rise and middle classes emerge. Also, the decline in share of GDP for health in recent years highlights the supply-side risks of financial protection. This will require ongoing monitoring, particularly given the experience of increased health-care costs in the past decade, which is associated with a rise in the number of noncommunicable disease (NCD) conditions and referrals at health facilities in Bhutan (see Figure 6). The cost of treating patients abroad, which represents 6% of total government expenditure on health care, is similarly expected to escalate.

Bhutan is currently undergoing *rapid health and social transitions*. The expansion of a market-based society is accelerating rates of migration and urbanization, as populations seek higher educational and income opportunities. The shift to a more urban-based society is giving rise to epidemiological and demographic transitions, with ageing of the population and the rise of NCDs. The main threat to UHC is that the epidemiological and demographic transition will outpace the capacity of health and social sectors to respond to it. It is not clear from the available data that the system capacity to respond to the rise in NCDs is being adequately measured, particularly

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**Figure 6:** Selected noncommunicable diseases in health facilities, 2006–2010

in the light of the fact that the three leading causes of death in Bhutan’s health facilities were alcohol-related liver diseases, “other cancers” and “other circulatory diseases”. A steady rise in consultations for NCDs is reported (see Figure 6), and assessments demonstrate limited capacity for implementation of essential NCD interventions. In addition to the issue of NCDs, the new economy, with expanded trade and commercial investment, is accelerating patterns of globalization, migration and urbanization. These social trends will require timely UHC policy responses to the needs of specific subpopulation groups, including migratory workers, adolescents and the urban poor, as well as to the persisting disease threats of HIV/AIDS, tuberculosis and malaria.

Political transitions (democratization, decentralization, private- and civil-sector emergence) will also put additional pressures on the health sector to increase its managerial responsiveness to emerging political and civil pressures for reform, particularly with regard to civil voice, decentralization and the potential for private-sector development in the medical sector. In recent years, a Local Government Act has been legislated, which now places accountability for health in the hands of local government officials. A Civil Society Organizations Act of Bhutan has been passed, which is an acknowledgement of the growth of civil society actors in recent years, and their potential to contribute to improved public health.

Although there is currently no legal framework for private medical sector operations, the growth of middle classes is likely to result in increasing demand for private-sector healthcare services in some form, which will ultimately require some form of health-policy or regulatory response. Overall, current health policy is keeping pace with socioeconomic and political transitions, although the health effects of these transitions will continue to demand ongoing monitoring, regulatory and policy responses to maintain and consolidate UHC pathways in Bhutan.

As this assessment demonstrates, although there is sufficient information to describe the UHC situation generally, there are gaps in information in relation to causality analysis, particularly with regard to issues of accessibility and acceptability of healthcare services, as articulated in the Tanahashi framework. Measurement of UHC in the context of Bhutan illustrates that acceptability and accessibility are, in fact, cross-cutting themes of the three dimensions of UHC. That is, acceptability may relate to the level of population coverage, service availability, or even financial protection (in terms of affordability of health care relating to indirect costs). Acceptability and accessibility issues then translate into pockets of low utilization, owing to regional or socioeconomic exposures. A major limitation of this assessment, however, is the absence of detailed facility standards for all levels of the health system, along with a system for assessing these standards, which limits capability to monitor service availability in a uniform manner on a nationwide basis. In this regard, there are also limitations in assessing service availability in the absence of a policy definition of essential medical and health-care packages. Quality of data is a critical issue in making valid assessments of district-level health-system performance. The present assessment relies heavily on the routine management information system, which needs further standardization of data variables and indicators, as well as institution of more rigorous quality checks. Although health financing is being monitored through national surveys and the National Health Accounts process, further research is required to assess the impact of indirect costs on access to care, and the consequent incidence of catastrophic health expenditure and impoverishment for lower socioeconomic groups. The main determinants of the decline in the share of GDP for health in recent years will also require further investigation, robust monitoring and active advocacy. The index scores must be interpreted with a lot of caution. As a prioritized list, the UHC index does not represent a comprehensive health-system assessment. There are issues of data quality with some indicators. Furthermore, the index may not be directly generalizable to other settings, since it draws heavily on the values underpinning Bhutan’s Eleventh Five Year Plan and the overarching GNH development framework.

The centrality of the concept of UHC to the principles of GNH, and hence to broader development and political strategy, should position health planners and policy-makers well in terms of securing adequate resource allocations for the health sector, as well as resource mobilization for development investments that are highly conducive to improved health outcomes (education, agriculture and rural development). It is important, however, that these wider health-development gains are not compromised by pockets of health and social disadvantage, as evidenced in the variation in coverage and accessibility across districts. The main logic for closer subnational tracking of the UHC index is the fact that relatively high national aggregates for population coverage and service availability may mask deep spatial and localized inequities in health-care access, particularly for scattered subpopulation groups, including remote populations, the urban poor, the migrant workforce and nomadic populations. In this way, UHC strategy can either be a “friend or foe”, in so far as aiming for high population coverage as a principal strategy exposes the risk that pockets of disadvantaged populations may be left to last in the rush for high population targets. Given that the issue of inequity is largely one of implementation, it is important to highlight development and implementation of a subnational assessment and planning methodology, to monitor and take action on variations in health-system performance at subnational and subpopulation levels.

CONCLUSION

The pathways to UHC in Bhutan are well established by the legal and policy mandates for universal access, the values enshrined in the GNH concept, and the substantial investments in health-sector development undertaken by the RGoB since the early 1960s. In meeting the challenges of epidemiological, demographic and social transition, this country clearly illustrates the growing observation internationally that “every country will develop its own path to UHC, reflecting its own culture and legacy from existing health systems”. Despite the well-established pathways for UHC in Bhutan, there are, however, identifiable gaps in service availability and population coverage, and a requirement for ongoing careful monitoring...
of financial protection. This increases the importance of measuring UHC performance regularly and more rigorously, in order to ensure that health outcomes continue to improve and that the health contribution to human development is shared equitably across all social classes and regions.

ACKNOWLEDGMENTS

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Correlates of out-of-pocket spending on health in Nepal: implications for policy

Indrani Gupta, Samik Chowdhury

ABSTRACT

Background: A key objective of universal health coverage is to address inequities in the financial implications of health care. This paper examines the level and trend in out-of-pocket spending (OOPS) on health, and the consequent burden on Nepalese households.

Methods: Using data from the Nepal Living Standard Survey for 1995–1996 and 2010–2011, the paper looks at the inequity of this burden and its changes over time; across ecological zones or belts, development regions, places of residence, or consumption expenditure quintiles; and according to the gender of the head of the household.

Results: The average per capita OOPS on health in Nepal increased sevenfold in nominal terms between 1995–1996 and 2010–2011. The share of OOPS in household consumption expenditure also increased during the same period, primarily as a result of higher health spending by poorer households. Thirteen per cent of all households were found to incur catastrophic health expenses in 2010–2011. This proportion of households incurring such expenditure rose between the two time periods most sharply in the Terai belt, eastern region and poorest quintile.

Conclusion: The health-financing system in Nepal has become regressive over the years, as the share of the bottom two quintiles in the total number of households facing catastrophic burden increased by 14% between the two periods.

Key words: generalized linear model, health expenditure, Nepal, Nepal Living Standards Survey, out-of-pocket

INTRODUCTION

Health equity has been conceptualized and defined in several ways, as its principles are derived from the fields of philosophy, ethics, economics, medicine, public health and others. The World Health Organization (WHO) defines inequity as “differences [in health status], which are unnecessary and avoidable, but in addition, are considered unfair and unjust”. The literature on social determinants of health brings into the health-inequity discussion a wide range of issues that result in social gradients in health. The focus on avoidable health inequalities between groups of people within countries, and between countries, which emanate from social and economic conditions, has an important corollary: inequities can be addressed to a great extent if one tackles, in the first instance, those that are accentuated because of existing anomalies in a variety of policies. The Commission on Social Determinants of Health notes that: access to and utilization of health care is vital to good and equitable health. The health-care system is itself a social determinant of health, influenced by and influencing the effect of other social determinants. Gender, education, occupation, income, ethnicity, and place of residence are all closely linked to people’s access to, experiences of, and benefits from health care.

A key factor in inequities in access to and utilization of health care is households’ need and ability to pay. The World Health Report on health-systems financing brings together a large body of evidence that highlights various barriers to access that enhance the vulnerability of a large section of low- and middle-income country populations to health shocks. Paying for health care from one’s own resources remains an important source of burden on households and, together with other social determinants of health, accentuates existing inequities. Moving towards a system of universal health coverage is certainly an important way of bringing down out-of-pocket spending (OOPS) and addressing a significant source of inequity in financing and, therefore, in health outcomes.
Nepal is a typical South Asian society, with many of its social inequalities coming from economic inequities compounded by issues of caste and ethnicity. It is among the poorest countries in the world, and ranked 157 on the Human Development Index of 187 countries during the year 2012. Regional imbalances play an important role. The latest Demographic and Health Survey in Nepal (2011) indicates that wealth inequality is higher in rural than urban areas. Among the three ecological zones – mountain, hill and Terai – wealth inequality is highest in the hills. Among the five development zones (eastern, central, western, mid-western and far-western), wealth inequality is highest in the central and mid-western development regions and in the mid-western hill subregions. Finally, as in other South Asian countries, there are gender inequalities in Nepal. This is evidenced by differences in, for example, education and health, and in significant gender-based violence. However, despite political instability and internal conflicts, which have constrained progress and growth, Nepal has been able to reduce poverty and inequality significantly; the overall Gini coefficient (based on expenditures) declined from 41 to 35 between 2003–2004 and 2010–2011.

This paper uses the Nepal Living Standards Survey (NLSS) over two periods to examine the level, variation and trend in OOPS in Nepal. Since regional imbalances are important in the country, we look at the changes in inequalities over time, and across ecological zones or belts, development regions, and rural–urban residence, in addition to consumption quintiles and gender of the head of household – the other two variables used to analyse inequality in household OOPS on health. It sets the context by discussing the health-financing system in Nepal and policies that have attempted to increase health coverage.

HEALTH-FINANCING SYSTEM

The public health system of Nepal comprises health clinics, sub-health posts, health posts, and primary health-care centres at the primary level, district and zonal hospitals at the secondary level, and regional and central hospitals at the tertiary level. Private health-care institutions in the form of hospitals, medical colleges and nursing homes have also emerged in the recent past.

Even before the 2007 interim Constitution enshrined basic health care as a fundamental right, the government had been making incremental efforts to increase access to health-care services, through a comprehensive framework of health policies, strategies and plans – such as the National Health Policy 1991, the Ninth Five Year Plan (1997–2002), and the Nepal Health Sector Programme Implementation Plan (2003–2007). The first policy intervention aimed at providing financial protection was introduced in 2006, when emergency and inpatient care was made free for vulnerable groups like the poor, destitute, elderly, etc. at district hospital and primary health-care centre levels. In 2007, free health care at the level of health posts and primary health-care centres was universalized. In 2009, all citizens were made eligible for free outpatient, emergency and inpatient services, and for drugs at district hospitals, primary health-care centres, health posts and sub-health posts. In 2009, the government introduced the Aama Suraksha Karyakram, a scheme targeting the demand side of safe motherhood. This scheme includes both consumer-led demand-side payments and provider payments. Consumers receive 1500 Nepalese rupees (Nr) in high mountain districts; Nr1000 in hill districts; and Nr500 in Terai districts, to cover transportation and other access costs. Health staff receive Nr200 per home delivery assisted; health facilities of up to 25 beds receive Nr1000 per delivery; and facilities with more than 25 beds receive Nr1500 for normal deliveries. These measures led to creditable improvements in health access and outcomes in Nepal, relative to its income levels; the rate of progress was better than in some of its neighbouring countries. Despite these measures, the private health sector has been growing steadily, and the household-level financial burden has increased concomitantly. Two important issues continue to afflict the current health-care system and are growing: (i) geographical and income-related inequalities in population health outcomes; and (ii) high household OOPS for health care, largely in the as-yet unregulated private sector.

The National Health Accounts (NHA) (2006/2007 to 2008/2009) give a fairly recent report on the state of health financing in Nepal. They show that total and per capita health expenditure has grown substantially over the years, and that the private sector is the chief source of health expenditure (60%), followed by the general government and the international community. Disquietingly, households spent about 90% of private health expenditure out of pocket, and about 55% of total health expenditure. In many countries, estimation of OOPS is based solely on household surveys; in Nepal, however, the NHA survey health-service providers. While the procedure’s efficacy and robustness can be debated, it allows classification of OOPS by agents, functions and providers. Retail sales and supplies of medical goods, private hospitals, clinics and laboratories are the main recipients of out-of-pocket payments; the NHA showed that, in terms of function, outpatient and curative care services together received around 78% of the total out-of-pocket payments.

Few studies have examined the extent and variation of the financial burden of OOPS on Nepalese households. The Central Bureau of Statistics carried out the first NLSS in 1995–1996, followed by another one in 2003–2004. The NLSS 2010–2011 is the latest available round. All three surveys followed the methodology of the Living Standards Measurement Survey (LSMS) developed and promoted by the World Bank. The NLSS (NLSS-III) was last conducted during 2010–2011, and was made available in November 2011.

Findings from one study that used the NLSS-I for household out-of-pocket expenses on health indicate that households spend around 5.5% of their total consumption expenditure on health care. Rural households spend more on health care than urban, after controlling for economic status. Another finding from the study is that households spend large amounts on health care when their initial consultation is with a public practitioner, even though such consultations are supposed to
be priced nominally. According to the authors, this probably indicates that private health-service providers complement public providers.

Another study used NLSS-I to investigate the determinants of household OOPS, controlling for sickness and provider choice, and found that income had both direct and indirect effects on health expenditure.17 The direct effect was measured by income elasticity of out-of-pocket expenditure; the indirect effect manifested as likelihood of illness and provider choice. Housing and sanitary conditions emerged as significant determinants of illness and, therefore, out-of-pocket expenses. This study also found higher average health-care expenditure among the rural sample than among the urban population.

Another landmark study of Nepal’s health financing is a benefit incidence analysis of health subsidies on population subgroups, categorized by region, caste, gender, dwelling area, income, poverty and multidimensional poverty.18 The study used NLSS-III data for demand-side variables and public expenditure review of the health sector for the supply side. Key findings suggest that the largest per capita gross subsidy goes to the western region of Nepal, whereas the largest net subsidies (net of direct cost recoveries, e.g. consultation fees) accrue to the mid-western and far-western regions. Women receive slightly higher gross subsidies than men. Finally, the fourth income quintile captures the highest public subsidy on health, while the bottom quintile captures the lowest.

A few other studies have looked into the issue of private OOPS on health and its economic impact in Asia in general, during the mid-1990s; Nepal was one of the countries in the sample.19–21 These studies have shown that, among the 11 countries, Nepal is one with the highest reliance on out-of-pocket payments to finance health care, and charges for public-sector care account for more than 40% of total out-of-pocket payments. Nepal had the highest poverty rates, which increased further when OOPS on health was subtracted from the total resources of the household.

Nepal has been considering ways to implement universal health coverage, though the exact process of implementing it remains undecided as of now. While augmenting and reallocating public resources within the health system and regulating the private sector would remain at its core, the design, amount and implementation level (national or subnational) remains to be decided.

METHODS

The NLSSs follow the LSMS, designed by the World Bank and also applied widely in other low- and middle-income countries. There have been three rounds of the NLSS (1995–1996, 2003–2004 and 2010–2011), all reasonably comparable on information range and schedule structure. There have been certain amendments though, in terms of the recall period. The NLSS-III comprises two independent samples: a cross-sectional sample of 5988 households and a panel sample of 1032 households. Half of these 1032 households were visited during NLSS-I as well. The survey collects information on aspects of household welfare such as demography, housing, access to facilities, consumer expenditure, education, and health, in rural and urban areas of the 75 districts of the country, grouped into three ecological belts and five development regions. The NLSS-I surveyed 3373 households.16 This study uses data from the cross-sectional sample of NLSS-I and NLSS-III.

The health section of the NLSS-III schedule comprises four parts: (i) chronic illnesses; (ii) illnesses or injuries; (iii) HIV/AIDS knowledge; and (iv) immunizations. The first part contains information on, among others, the type of illness and the expenditure incurred on its treatment in the past 12 months. The second part, which might be interpreted as acute illnesses, contains information on the same variables but for a reference period of 30 days. The NLSS-I schedule also contains these sections, except the one on HIV/AIDS knowledge. In this study, the annual value of the health expenditure on acute illnesses was derived from the monthly figures, and added to the health expenditure on chronic illnesses – already available on an annual basis – to arrive at a household’s total annual health expenditure. For total consumption expenditure, food expenditure, frequent non-food expenditure, infrequent non-food expenditure and the value of inventories (durable goods) purchased within a year from the date of the survey were added together. Total consumption expenditure is inclusive of the consumption of home production.

Consolidated expenditure on health by the households was also available from the section on frequent non-food consumption in the NLSS schedule. However, this estimate was quite different from the total health expenditure obtained from the section on health, following the methodology discussed above. Health expenditure derived from the health section was considered as the actual out-of-pocket expenditure on health. Consequently, an adjustment had to be made to the total consumption expenditure. Consumption expenditure was adjusted by deducting the health expenditure reported in the section on frequent non-food consumption from the total consumption expenditure, and then adding the health expenditure obtained from the health section. Thus, the total consumption expenditure estimated is different from the reported total expenditure in other studies that have used NLSSs.

To understand which variables might influence health spending and health share, a simple regression was run on the pooled data from the two surveys. Two models were tested, with the dependent variable being per capita health spending and share of health in total household spending, respectively. The explanatory variables were belt, rural–urban, region, consumption category, gender of the head of household, and a created variable indicating the time period.

Since health-care expenditures are not generally normally distributed, use of ordinary least squares analysis may yield biased results. Such expenditures frequently have a log-normal or gamma distribution;22 thus, the generalized linear model is more appropriate. The equation was estimated using the generalized linear model, with the assumption that the log link has a gamma error distribution.23,24
RESULTS

Out-of-pocket spending on health

Table 1 shows the estimates of out-of-pocket annual health expenditure, total consumption expenditure and adjusted consumption expenditure. As shown in Figure 1, the average per capita OOPS on health in Nepal increased sevenfold in nominal terms between 1995–1996 and 2010–2011, and currently stands at NRP3278. The factor by which nominal OOPS on health per capita increases between the two periods varies widely across select socioeconomic characteristics – the increase was fourfold for urban Nepal, sevenfold for rural Nepal, sixfold for the eastern and far-western region, and eightfold for the central region. Perhaps the most significant of all observations emerges when the increase factor across consumption expenditure quintiles is examined. The richest quintile experienced a fivefold increase, while in 2010–2011, the poorest two quintiles spent more than 10 times the amount that they did in 1995–1996.

Figure 2 presents the share of OOPS in total consumption expenditure (henceforth OOP share) of households between the two rounds. Clearly, this share has increased from 3.4% per cent in NLSS-I to 4.5% in NLSS-III. This increase has been quite uniform across all the parameters examined, except for the western region. The other point to note is that OOP share is higher for rural areas than for the urban areas, and, among the three belts, highest for the Terai belt, where the increase between the two rounds has also been sharp. The increase has also been sharp for the eastern, central and mid-western regions.

In terms of consumption quintiles and gender of the household head, Figure 2 indicates that the increase between the two rounds has been sharpest for the first two quintiles. In fact, the richest quintile has seen a fall in OOP share. There seems little difference in OOP share between male-headed households and female-headed households, but both have seen a rise between the two periods. Overall, however, the results indicate that the distribution of OOPS was rather progressive in the earlier period and has worsened slightly.

The results of the regression analysis of the pooled data from the two surveys are reported in Table 2. As mentioned before, the objective of these regressions is to understand the determinants of OOPS on health of households. Two variants, with dependent variables as per capita health spending and share of health expenditure in household consumption expenditure, respectively, were estimated. The first set of estimates indicates that the statistically significant results are the positive association of OOPS with income (the higher the

<table>
<thead>
<tr>
<th>Table 1: Estimated out-of-pocket and consumption expenditures</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of households</td>
</tr>
<tr>
<td>----------------------</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td><strong>Sector</strong></td>
</tr>
<tr>
<td>Rural</td>
</tr>
<tr>
<td>Urban</td>
</tr>
<tr>
<td><strong>Belt</strong></td>
</tr>
<tr>
<td>Mountain</td>
</tr>
<tr>
<td>Hill</td>
</tr>
<tr>
<td>Terai</td>
</tr>
<tr>
<td><strong>Region</strong></td>
</tr>
<tr>
<td>Eastern</td>
</tr>
<tr>
<td>Central</td>
</tr>
<tr>
<td>Western</td>
</tr>
<tr>
<td>Mid-western</td>
</tr>
<tr>
<td>Far-western</td>
</tr>
<tr>
<td><strong>Expenditure quintiles</strong></td>
</tr>
<tr>
<td>Poorest</td>
</tr>
<tr>
<td>Second</td>
</tr>
<tr>
<td>Middle</td>
</tr>
<tr>
<td>Fourth</td>
</tr>
<tr>
<td>Richest</td>
</tr>
<tr>
<td><strong>ALL</strong></td>
</tr>
</tbody>
</table>

NLSS: Nepal Living Standards Survey; NRP: Nepalese rupees.
Gupta and Chowdhury: Out-of-pocket health spending on health in Nepal

Figure 1: Ratio of per capita out-of-pocket expenditure – 2010–2011 to 1995–1996

Figure 2: Share of out-of-pocket health expenditure in total consumption expenditure of households

NLSS: Nepal Living Standards Survey.

income, the higher the OOPS), the lower association for hills and mountains compared with the Terai belt (interpreted to mean that OOPS is relatively higher for the Terai than for the other two regions), and higher expenditure in all the regions compared with the omitted far-western category (indicating that OOPS is lowest in this region compared with the other categories). Also, OOPS is significantly lower for the earlier period than the later one. In the case of the health-share model, too, the coefficients are of the same sign and strength except for the mid-western region, which seems no different from the far-western region.

A consistent negative significant coefficient corresponding to the time (NLSS) variable indicates that OOPS and shares
Table 2: Determinants of out-of-pocket spending on health

<table>
<thead>
<tr>
<th>Independent variables</th>
<th>GLM (dependent variable: per capita health spending)</th>
<th>GLM (dependent variable: share of OOP in total household consumption)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Coefficient</td>
<td>z</td>
</tr>
<tr>
<td>Rural</td>
<td>–0.15</td>
<td>–2.1*</td>
</tr>
<tr>
<td>Female head</td>
<td>0.02</td>
<td>0.37</td>
</tr>
<tr>
<td>Per capita consumption</td>
<td>0.00001</td>
<td>9.6***</td>
</tr>
<tr>
<td>NLSS round (NLSS-I = 1)</td>
<td>–1.2</td>
<td>–15.3***</td>
</tr>
<tr>
<td>Belt</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hill</td>
<td>–0.17</td>
<td>–2.7***</td>
</tr>
<tr>
<td>Mountain</td>
<td>–0.28</td>
<td>–2.3**</td>
</tr>
<tr>
<td>Region</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Eastern</td>
<td>0.47</td>
<td>4.1***</td>
</tr>
<tr>
<td>Central</td>
<td>0.48</td>
<td>4.5***</td>
</tr>
<tr>
<td>Western</td>
<td>0.57</td>
<td>4.9***</td>
</tr>
<tr>
<td>Mid-western</td>
<td>0.22</td>
<td>2.0**</td>
</tr>
<tr>
<td>Constant</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Link</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Family</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Observations</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*,, ** and *** represent significance at 99%, 95% and 90% confidence intervals, respectively.

GLM: generalized linear model; NLSS: Nepal Living Standards Survey.

Figure 3: Coefficient of variation in share of health in total household expenditure

NLSS: Nepal Living Standards Survey.

have increased between the two rounds. As from Figures 1 and 2 it can be seen that this increase has not been uniform within groups, it is important to objectively identify inequality within the groups and its behaviour over time. One easy way of verifying this is through the coefficient of variation. The change in the coefficient of variation of the share of health in household consumption was analysed across the regional and gender variables. Figure 3 indicates a substantial decline in the inequality in the share of OOPS across the belts and regions, but more so for the regions. The inequality in health share between rural and urban areas has increased slightly but not changed for female- and male-headed households.

The conclusion is that, while per capita OOPS and its share in total household consumption has increased over the years, the inequality in the share of OOPS within certain groups has declined. In other words, while all households are spending a higher amount out of pocket, their share shows lesser variation within the selected categories. The explanation is straightforward and may be seen in Figure 2, which shows that...
the share showed only a small increase for those who were already spending more on health; rather, it increased at a faster rate for those with a relatively lower share during 1995–1996. Thus, an increase in OOPS at the lower end of the distribution is driving the inequality results. This is evident from the earlier results, where the ratio of health share of lowest to highest income quintile was only 0.38, which subsequently increased to 0.92, indicating that the poor are spending as much as the rich on health as a share of total consumption. Further analysis is needed to understand where exactly the burden of higher OOPS falls the most.

**Distribution of out-of-pocket burden**

This section attempts to look at the possible burden of catastrophic payments across the various categories in Nepal, to understand the distribution of such burden across regions and economic categories. While researchers have defined catastrophic payment in many ways, health spending is defined here as catastrophic if it is 10% or more of total household expenditure.\(^\text{25–28}\) Figure 4 presents the results on catastrophic expenditure, that is, the proportion of households in each category that spend more than 10% of their total consumption expenditure on health care. The percentage of households incurring such expenditure has increased, on average, from 10.7% in the earlier period to 13% in the later period. Also, the proportion has increased in rural areas and decreased in urban areas, although the difference is small for the latter. The proportion has increased from 12.9% to 16.2% in the Terai, which has seen the highest increase among the three belts. However, the other two belts have also seen some increase. The eastern region has seen the largest increase among regions, followed by the central and mid-west; the western region has actually seen a fall, and there has been no change in the far west.

For income quintiles (see Figure 4), the largest increase in the proportion of households with catastrophic expenditure is from the poorest quintile, followed by the second quintile. The third and fourth quintiles have remained more or less the same, with a slight fall for the third quintile; and the richest quintile showed a decrease from 16.0% to 12.1%. An important observation is that the catastrophic headcount had a roughly positive income (consumption) gradient in 1995–1996, which is no longer the case, in the recent period. Figure 4 clearly shows that in 2010–2011 more households in the lower quintiles had to face the catastrophic impact of out-of-pocket health expenses, compared with those in the higher quintiles. In terms of gender of the household head, both types of households have experienced an increase in catastrophic burden over the two periods.

The most pertinent question for policy-makers is the composition of households experiencing catastrophic expenditure. The question can be posed thus: of all households experiencing catastrophic expenditure, what is the distribution across (for example) belts?

Figure 5 presents the percentage distribution of households facing catastrophic expenses over these categories for each year. The most important finding is that the bulk of households struck with catastrophic payments are in rural areas – 91.5% in the earlier period, which has reduced to 81.7%. The results did not change much for the three belts between the two periods, but in 2010–2011 over 56% of households that experienced catastrophic expenditure were in rural areas, compared to 81.7% in 1995–1996.

**Figure 4:** Households spending more than 10% of total consumption expenditure on health

<table>
<thead>
<tr>
<th>Sector</th>
<th>Belt</th>
<th>Region</th>
<th>Expenditure Quintiles</th>
<th>Gender-Head</th>
<th>ALL</th>
</tr>
</thead>
<tbody>
<tr>
<td>Urban</td>
<td>Rural</td>
<td>Mountain</td>
<td>Hill</td>
<td>Terai</td>
<td>Eastern</td>
</tr>
</tbody>
</table>

*NLSS: Nepal Living Standards Survey.*
Gupta and Chowdhury: Out-of-pocket health spending on health in Nepal

Figure 5: Percentage distribution of households experiencing catastrophic burden of out-of-pocket health spending

Catastrophic expenditure lived in the Terai region. Between the two periods, the eastern, central and mid-western regions show an increase in their share of households facing catastrophic health expenses in Nepal. Circumstances are better in the western region, whose share has declined by 11% between the two periods, followed by the far-western region. As for consumption categories, the share of the bottom two quintiles in the total number of households facing catastrophic burden increased by 13.9% between the two periods and in 2010–2011, 45% of the worse-hit households come from the two lowest quintiles. The upper three quintiles also contribute to the total burden significantly, although less than the two lower quintiles. Finally, the proportion of female-headed households experiencing catastrophic expenditure has increased, although most households are headed by a male.

Discussion

In Nepal, OOPS increased by more than 30% over a 15-year period, with the share of OOPS in consumption expenditure rising from 3.4% in 1995–1996 to 4.5% in 2010–2011. It is still lower than other South Asian countries such as India (over 7%). The average share increased because poor households increased their health spending. The incidence of catastrophic expenditure has increased, occurring mostly in rural areas, the eastern region, the Terai, and among the poor.

There are important policy implications: first, if OOPS is not addressed, it can contribute to poverty because of its impact through catastrophic expenditure. The vulnerable sections of the population need immediate special attention in any universal health coverage scheme, especially if it is rolled out in a phased fashion. The most effective use of scarce resources for universal health coverage would be to target the priority areas highlighted by the preceding analysis, where most vulnerable households reside.

References

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Access to and utilization of voucher scheme for referral transport: a qualitative study in a district of West Bengal, India

Dipta K Mukhopadhyay, Sujishnu Mukhopadhyay, Dilip K Das, Apurba Sinhababu, Kaninika Mitra, Akhil B Biswas

ABSTRACT

Background: Lack of motorized transport in remote areas and cash in resource-constrained settings are major obstacles to women accessing skilled care when giving birth. To address these issues, a cashless voucher transport scheme to enable women to give birth in a health-care institution, covering poor and marginalized women, was initiated by the National Rural Health Mission in selected districts of India in 2009.

Methods: The access to and utilization of the voucher scheme were assessed between December 2010 and February 2011 through a qualitative study in the district of Purulia, West Bengal, India. Data were collected from in-depth interviews and focus group discussions with women, front-line health-care workers, programme managers and service providers.

Results: The main factors influencing coverage and utilization of the scheme were: reliance on ill-prepared gram panchayats (village councils) for identification of eligible women; poor birth preparedness initiatives by health-care workers; over-reliance on telephone communication; restricted availability of vehicles, especially at night and in remote areas; no routine monitoring; drivers’ demand for extra money in certain situations; and low reimbursement for drivers for long-distance travel.

Conclusion: Departure from guidelines, ritualistic implementation and little stress on preparedness of both the community and the health system were major obstacles. Increased enthusiasm among stakeholders and involvement of the community would provide opportunities for strengthening the scheme.

Key words: access, demand-side financing, India, maternal health, pregnant women, referral transport, voucher

INTRODUCTION

Despite the remarkable reduction in maternal mortality in recent years, there were 50 000 maternal deaths in India in 2013. It has been agreed that the majority of these deaths could have been prevented through making skilled care at birth and access to round-the-clock emergency obstetric care more universally available. As a signatory of the Millenium Declaration, India is committed to 75% reduction in maternal mortality between 1990 and 2015. Institutional childbirth has become the core strategy in achieving that goal.

Lack of access to transport and available cash to meet the cost of transport, combined with lack of awareness, are major challenges in accessing institutional care for childbirth. The “three delays” model (delays in seeking, reaching and receiving health care) could explain the crucial factors associated with maternal mortality. In a review of maternal deaths in the Purulia district of West Bengal, it was noted that delay in seeking care for childbirth was mostly due to lack of awareness and capacity for making decisions at appropriate times. Lack of available cash at home and transport were two major obstacles to reaching care. Delays in both seeking and
reaching care were more common among illiterate and poor women, as well as scheduled caste and tribeswomen. Studies in India have also reported a lack of preparedness of the health system and delays in receiving maternal care.9,10

Demand-side financing (DSF), such as cash transfer and voucher schemes, is being used worldwide to transfer purchasing power to the intended beneficiaries.11 Various DSF schemes have been found to be effective in improving consumer behaviour, although the effects have been varied depending upon the context.12-13 Several researchers have observed that DSF schemes have helped in improving the use of priority maternal care services, particularly in low- and middle-income countries such as India.4,12,13 Voucher schemes have been used successfully to increase the access to formal health services for antenatal, intranatal and postnatal care in Bangladesh and Cambodia.15-17 India’s largest DSF scheme, Janani Suraksha Yojana, was able to increase the rate of institutional childbirth and reduce perinatal and neonatal mortality.18 Implementation of targeted voucher schemes, such as the Chiranjeevi scheme in Gujarat and the Sambhali voucher scheme in Uttar Pradesh, also improved the intended health behaviours of beneficiaries in India.4,19

The Government of India initiated cash assistance for transport of rural below poverty line (BPL), scheduled caste (SC) and scheduled tribe (ST) pregnant women for institutional childbirth under the Referral Transport Scheme (RTS) in several states of India including West Bengal.20,21 However, researchers showed that the obstacle of non-availability of transport, especially in remote areas, was not addressed by provision of cash assistance.17 Two research studies from Uganda documented increased utilization of maternal health-care services with the provision of motor cycle ambulances through vouchers.22,23 In 2009, the Government of West Bengal started a cashless transportation service (voucher scheme for referral transport) for rural BPL, SC and ST pregnant women to receive institutional care at childbirth and during pregnancy-related complications, as well as for all sick neonates needing institutional care.24 Purulia is one of the first few districts where the scheme was launched.

Researchers have indicated a number of limitations of DSF schemes to promote maternal health.4,12 It has also been noted that understanding of what works best in a given context determines the sustainability and ability to scale up DSF schemes.12 One year after the initiation of cashless transport, the state government planned to scale up the scheme, after taking into account the shortcomings of the scheme that is running currently.25 So the present qualitative study was conducted in the transitional phase, with the objectives of understanding the process of identifying beneficiaries, distribution of vouchers, availability and accessibility of vehicles, assessing the quality of service and factors pertaining thereto, as well as generating suggestions from different stakeholders to increase the efficiency and effectiveness of the scheme.

OVERVIEW OF THE VOUCHER SCHEME

Taking into consideration the limitations of giving cash assistance under the RTS, a cashless transport service using vouchers was started in West Bengal as a pilot project, in addition to continuing with the existing RTS.24 The voucher scheme envisaged provision of cashless transportation to health-care facilities for BPL, SC and ST pregnant women for childbirth and all sick neonates needing care. The voucher was a coupon that guaranteed cashless transportation of targeted beneficiaries free of cost by enlisted ambulances or vehicles. The district health and family welfare samiti, the highest decision-making and executive body for the health system in the district, supplied the vouchers for distribution among eligible women. After a third antenatal check-up, an auxiliary nurse midwife (ANM) posted at the subcentre, with the help of an accredited social health activist (ASHA) distributed a set of three vouchers to the eligible women. Voucher-1 was for transport from home to the nearest appropriate health facility and voucher-2 was for the journey home. In cases of referral to a higher-level centre, voucher-3 could be used. After authentication by the attending doctor, the drivers of the vehicles had to submit the vouchers to the health authority of their community development (CD) block for reimbursement according to the distance: ₹ 150 for 1–10 km, ₹ 250 for 10–20 km, ₹ 350 for 20–30 km, and ₹ 450 for more than 30 km.24

Ambulances operating under public–private partnerships run by nongovernmental organizations (NGOs) or private vehicles (one per CD block) were enlisted by the respective CD block health authorities in concurrence with the district health authority. Certain quality measures were taken into consideration during selection of the enlisted vehicles. One such crucial measure was to ensure that no pregnant woman was denied transport provided that the vehicle was not engaged in transporting any other pregnant woman or seriously ill patient. A memorandum of understanding was signed between the health authority and the provider. The present study analysed data obtained during this transitional phase of the scheme.21,24

Subsequently in 2011, the cashless transport scheme was renamed first as Nischay Yaan and then as Matri-Yaan Prakalpa in West Bengal, and all conditionalities were removed to cover all pregnant women and ailing neonates.25 At present, it is incorporated into the Janani Shishu Suraksha Karyakram (JSSK), launched by the Government of India with the objective of ensuring no out-of-pocket expenditure for institutional care for childbirth and sick neonates, including transport.26

METHODS

Study design

A qualitative study using semi-structured interviews and focus group discussions was conducted in the district of Purulia during April–May 2011. The study area was Purulia, a district located in the westernmost part of West Bengal, India, covering 6258 km², and with undulating topography and rugged hilly
terrain. The district has a population of 2.5 million, more than 36% of which belong to scheduled castes and tribes. Over 90% of the population resides in 2685 villages spread across 20 CD blocks and 170 gram panchayats.

Out of a total 20 CD blocks in Purulia district, data from four (20%) were used in the present study. The 20 CD blocks were grouped into four strata based on their distance from Purulia town (with a cut-off of 50 km) and reported coverage of the voucher scheme (cut-off of 50%) in the year 2010. From each stratum, one CD block was selected by random sampling. The percentage of reported coverage was calculated from the total number of women who used at least one voucher and the total number of deliveries in that CD block, as reported in the monthly report submitted by each CD block to the district health authority.

Methodology

In the selected blocks, a list of eligible pregnant women at each subcentre who delivered a baby in the reference period of 3 months (December 2010 to February 2011) and who were inducted in the voucher scheme was prepared by the respective ANMs and ASHAs. Data on utilization of vouchers were collected from the respective CD block health administration. As the exact number of the target population was not available for the four study CD blocks, an estimate of 3100 deliveries was used. This estimate was based on the birth rate of the district, as calculated from the yearly report of the Health Management Information System (HMIS) 2010 and the population of the CD blocks. Around one third (N=1120) of the total number of pregnant women were enrolled in the scheme and less than one quarter (N=771) actually utilized the scheme.

The 25 women who were eligible for vouchers and who delivered in the reference period were selected through stratified purposive sampling based on the number of vouchers they used. It was ensured that there was participation of BPL, SC and ST women in each CD block. After explaining the objectives of the study, the voluntary nature of participation, and informing them that their responses would be recorded and used, written informed consent was obtained from the women. They underwent an in-depth interview in the local language (Bengali) at their household using a predesigned semistructured interview guide giving information on the process of induction into the voucher scheme, the services they could use and their accessibility and the problems they faced, as well as being asked for suggestions to make the scheme more effective and user-friendly.

Focus group discussions were conducted separately with ANMs and ASHAs in Bengali in each identified CD block, which had been selected through two-stage random sampling. A predesigned discussion guide was used to collect the views of the focus group on the process of service provision, including its availability, accessibility and quality, and the bottlenecks they perceived, as well as their suggestions for increasing the effectiveness and efficiency of the scheme.

In-depth interviews were carried out with the following health officials: block medical officer of health (BMOH), block public health nurse (BPHN) and block accounts manager (BAM) of all four blocks; and district-level health officials, including the chief medical officer of health (CMOH), district maternal and child health officer (DMCHO), district public health nursing officer (DPHNO) and district accounts manager (DAM). These interviews were conducted at the offices of the officials, with a predesigned, semistructured interview guide in Bengali to collect their views on the process and outcomes of the scheme, its strengths and weaknesses, and opportunities and suggestions for successful implementation of the scheme. Focus group discussions with NGO representatives and in-depth interviews with drivers of enlisted vehicles/ambulances were also conducted to obtain an account of the views of the service providers. Interview and discussion guides were used to ensure that the moderator/interviewer addressed all the issues pertinent to the study. Three separate sets of interview guides were prepared for: (1) beneficiaries, (2) block-level and district-level programme managers, and (3) drivers of enlisted vehicles/ambulances. Two separate discussion guides were prepared for: (1) health-care workers (ANMs and ASHAs) and (2) NGO representatives. Interview and discussion guides were prepared in Bengali and reviewed for linguistic correctness and appropriateness by three independent public health professionals whose mother tongue was Bengali. The guides were pretested among beneficiaries, health-care workers and health managers in a CD block outside the study area to check clarity, appropriateness and flow of questions. Two investigators trained in qualitative techniques performed the role of moderator/interviewer. Another investigator took written notes. All the interviews and discussions were recorded on audiotape.

Data management

An independent health-care professional transcribed the audiotapes and translated the content into English. The transcripts were reviewed by three investigators separately. From the reviews, investigators summarized and coded the data, and prepared a list of key themes. These were compared and contrasted, and a final list of key themes was identified.

Ethics

The study was carried out in accordance with the ethics standards for an observational epidemiological study and ethics approval was obtained from the Institutional Ethics Committee, BS Medical College, Bankura.

Study participants

The following numbers of participants took part in the scheme: 25 beneficiaries (seven SC, eight ST, ten BPL); 81 front-line health-care workers, comprising 41 ANMs (28 first ANMs/ Health Worker-Female (in-charge of the health sub-centre) and 13 second ANMs), 40 ASHAs; 12 CD block-level programme
managers (BMOHs, BPHNs and BAMs of four CD blocks); four district-level programme managers (CMOH, DMCHO, DPHNO, DAM); 13 service providers (eight NGO officials, five drivers).

**RESULTS**

Of the 25 participating women, 11 used voucher-1, 10 used voucher-2, five used voucher-3, two used a cash benefit for referral transport and five did not use any benefit under the voucher scheme. Except for five women who had a home delivery, another four women were unable to use any of the vouchers they were given. Out of the 25 beneficiaries, 10 were from BPL families, seven were SC and eight were ST.

Through using the qualitative survey, a number of themes related to implementation of the voucher scheme for referral transport were identified.

**Access to vouchers**

The majority of the beneficiaries were aware of the cash benefits for transport and/or cashless transport to health-care facilities available to pregnant women of poor families for childbirth, although the women did not know the exact nature of service available under the scheme. One beneficiary commented, “We knew that some amount of cash would be given at the health centre for transport by any means.” Another beneficiary commented, “[The ANM] gave me a few pink cards and a phone number. She told me that I would get a vehicle free of cost to go to hospital for delivery if I would call at that number.” However, no beneficiaries and few front-line health-care workers were aware of the availability of the service for ailing neonates.

ANMs and ASHAs indicated that they informed the beneficiaries about the services available under the voucher scheme during antenatal visits. Similarly, health managers of CD blocks reported that they had made efforts to involve the general administration and people’s representatives, both formally and informally.

*Pradhans* (heads) of the respective *gram panchayats* (rural self-governments) were delegated the authority to issue eligibility certificates to the beneficiaries. In explaining the reasons for such a relaxation in the guidelines, one block-level health official commented, “If we stick to the guidelines for documentary evidence of their SC/ST/BPL status, then I apprehend that even 5% of them would not get the benefits. It is almost impossible for poor people of scheduled castes or tribes to go to the office of the BDO (block development officer)/ SDO (subdivisional officer) to collect caste certificates.”

Health-care workers and programme managers alike observed that this type of arrangement, though liable to errors of inclusion (of the non-targeted population) and exclusion (of the targeted population), had made things easier for women and other stakeholders. One programme manager observed, “In case of SC/ST, generally there is no problem in issuing certificates. However, in case of BPL, it actually depends upon the individual discretion of the *panchayat pradhan*. Sometimes, we have to request the *pradhan* for a woman who is really poor.”

Usually, vouchers were distributed by the ANM after a third antenatal check-up at the subcentre. One public health nurse commented, “We usually distribute the vouchers after the third antenatal check-up. Sometimes, we have to distribute vouchers after one or two antenatal visits, if the woman decided to go to her parental house before delivery.”

However, many front-line health-care workers and programme managers found no reason to withhold distribution of the vouchers because of non-fulfillment of the precondition that the woman made three antenatal visits. One front-line health-care worker expressed, “We should not refrain from distributing vouchers for cashless transport for childbirth merely because of her inability to attend three antenatal visits.”

Birth preparedness and complication readiness were found to be lacking in the majority of beneficiaries. Most were unsure about the precise time (stage of labour) to call an ambulance or the vehicle. One beneficiary expressed her helplessness, “I should have known the precise time to call for the ambulance. Had I called a little while earlier, I could have availed of the facility.”

The process of seeking vehicle services in an emergency was not made clear to the beneficiaries. Another beneficiary of a remote village said, “If [the ANM] would tell us clearly that just by calling over a phone I could get a vehicle free of cost to go to hospital, I would not have to suffer all through the night and my husband would have not to rush to another village late in the night to arrange a vehicle.”

Though the front-line health-care workers were able to enumerate the general danger signs or symptoms, they lacked the confidence to recognize true labour pains and key danger signs. When questioned, they expressed the need for hands-on training to identify these conditions.

**Utilization of vouchers**

The success of the entire programme was based on the availability of telephone and telecom networks in the villages. These were not available in a few villages, as reported by health-care workers. Though the majority of the beneficiaries were able to contact the drivers of the vehicles, in some instances the driver did not pick up the telephone or they communicated their inability to provide the transport. Front-line health-care workers also complained that, in some cases, there was no response from the drivers, especially during the night.

Beneficiaries had different experiences of the vehicle support, depending on the remoteness of their village and the time of the call. In the majority of occasions, the ambulances reached the houses of the beneficiaries within a reasonable time after receiving the telephone calls, with a few exceptions in hard-to-reach areas where mothers had to travel a distance to a road that was passable by doli/cycle/rickshaw to access the free ambulance service. Although there was provision in the guidelines, reimbursement of money for transport from home...
to the passable road was not reported to have been claimed or known about by any of the beneficiaries.

Pregnant women from remote villages faced different problems in accessing transport, especially if they sought care at night. One ANM described her experience of the non-availability of an ambulance at night, which ultimately led to a stillbirth. Another ANM of a remote subcentre, near the Jharkhand (bordering state) border, said that on one occasion, the driver asked the woman to come to the main road from where he would transport her; however, when the woman reached the road and rang him, he refused to come. One beneficiary, who could not avail of the ambulance despite her best efforts, commented, “The whole process would be meaningless if there is an inadequate number of vehicles under the scheme or the drivers refuse to come in an emergency.” Beneficiaries who had no problems using the services felt that the number of vehicles was adequate.

Front-line health-care workers and the majority of block-level health officials thought that the number of ambulances/vehicles was inadequate. In contrast to the present practice of stationing the ambulances at block-level facilities, health-care workers and block-level health managers were of the opinion that they should be stationed at the offices of the gram panchayats. However, the district-level health officials and NGO partners felt that there were few problems with pregnant women accessing the vehicles. The issues of road condition and security concerns in certain areas were pointed out as impediments.

Health managers reported that the enlisted vehicles, though most had been on the road for 8–10 years, were in good general condition with adequate space. The majority of drivers were experienced. This was corroborated by NGO participants and drivers. The beneficiaries reported that the behaviour of the drivers was polite and respectful. Beneficiaries, NGO participants and drivers reported that most of the drivers helped in the admission process and waited until the attending doctor decided about the management of the case. NGO participants and drivers expressed their dissatisfaction on the reimbursement package for travel beyond 40 km. Drivers, NGO participants and health-care workers reported that in cases of false labour pain or pregnancy-related complications, there was difficulty in obtaining reimbursement for the vouchers. In such situations, some drivers had claimed money from the beneficiaries, and this created a lot of confusion and dissatisfaction among all the stakeholders. In only a few instances did drivers claim extra money from the woman or her family.

All stakeholders felt that there was a need for a skilled attendant to be present during transport of the pregnant women; however, in reality, this occurred in only a few cases.

**DISCUSSION**

Evidence from resource-constrained countries has indicated success in experiments with DSF in increasing the utilization of maternal health-care services. Similar results have been reported from India. However, several researchers have also emphasized the need for regular review of governance and implementation of the schemes, along with attention to supply-side conditions. The present study looked into a number of issues on access to and utilization of a voucher scheme for referral transport in the study area.

In a relaxation of the guidelines, panchayat pradhans were delegated the power to identify beneficiaries. As a part of decentralization process, the Panchayati Raj System has been put in place in India. The gram panchayat is the most peripheral unit, working at village level. The pradhan (head) of a gram panchayat, as an elected representative from the same community, is better placed than a statutory authority to issue eligibility certificates to beneficiaries. In the absence of objective criteria, there was scope for exclusion (of target population) and inclusion (of non-target population) errors. It was noted that decentralization of authority to issue eligibility certificates, along with multi-item objective criteria-based identification of the target population by a group at block level, might be a viable alternative; this model has been used in Bangladesh with some success. The idea has also been supported by Hunter et al. An alternative might be to remove all conditionalities and target the scheme universally. Hunter et al. and de Poel et al. observed that a universal system was found to be better in changing the behaviour of beneficiaries, and that it was more effective than a targeted scheme for the poor and marginalized sections of society. A universal system also reduces the administrative cost of targeting.

Information sharing with beneficiaries was usually carried out during antenatal visits at subcentres. However, efforts from front-line health-care workers to maximize the coverage for utilization of the scheme through home visits were found to be infrequent. The mandatory precondition of three antenatal check-ups was not adhered to by the front-line health-care workers so that coverage could be enhanced, as it was considered to be defeating the purpose of promoting cashless transport among those who needed it most.

Under the programme implementation plan, vouchers were not issued to provide transport for sick neonates or eligible women with pregnancy-related complications. Moreover, cashless transport for sick neonates, though included in the voucher scheme, was almost unknown to both health-care workers and beneficiaries. There should be an adequate plan to cover women with pregnancy-related complications and ailing neonates through the issue of a separate set of vouchers.

The majority of front-line workers knew about pregnancy-related complications but they were unable to recognize situations when urgent referral was warranted. In addition, they were unable to distinguish between true and false labour pain. In most cases, they did not pass on their knowledge to the beneficiaries. The majority of beneficiaries did not know the precise time (with respect to stage of labour) and the correct process to call the vehicle. Building the capacity of front-line workers is therefore an urgent priority.

The concept of “focused antenatal care” should be brought into enable front-line workers give individualized care to pregnant women and to create awareness regarding birth preparedness and complication readiness among pregnant women, their families and the community at large. Self-help groups,
ladies groups’ and adolescent schoolgirls’ groups can be used to help introduce changes. Availability of a telephone in every village should be ensured, as this was lacking in certain instances. The district-level programme managers were content with the availability and accessibility of vehicles, though they recognized that there was scope for improvement. However, beneficiaries and some health-care workers who experienced a lot of inconvenience, especially in remote areas and at night, thought otherwise. There must be a review system to address this issue. Adequate numbers of vehicles, preferably stationed at the gram panchayat level, and a realistic reimbursement package including other incentives might improve the availability and accessibility of vehicles/ambulances. Involvement of a social franchise, a self-help group, an NGO network or a village health and sanitation committee might play a crucial role in this endeavour. Stationing the vehicle at gram panchayat level, as suggested by health-care workers and block-level health managers, would address the problems of reaching households in remote areas and further reduce the delay in reaching households. Problems of road conditions and security concerns also need to be addressed. Demand for informal payments by drivers, although few, is a matter of concern. Similar findings have been reported by other DSF schemes.\(^{3,12}\) Research has indicated the need for effective regulatory mechanisms and timely reviews of the programme and its guidelines to ensure quality; this would also create an opportunity to look into informal payments.\(^{4,12}\) Availability of a cash incentive complemented the voucher scheme. In the absence of a cash incentive scheme, non-availability of enlisted vehicles means not only denial of transport to an eligible woman in an emergency but also a negative image of the health system.

CONCLUSION

Guidelines regarding the process of identification of beneficiaries, number of vouchers, preconditions and reimbursement package, particularly for travel beyond 40 km and transport for false labour pains or pregnancy-related complications need to be reviewed. Capacity building of women as well as health workers is a priority for reducing delays in making decisions. Providing the opportunity to address the constraints and limitations of the present scheme might become a strength of the system during the implementation of any new scheme.

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Contributors: DKM, ABB and KM conceived the study, DKM, ABB, SM, DKD, AS and KM participated in designing the study. DKM, SM and AS participated in data collection. DKM, DKD and ABB analysed the data and all other authors participated in interpreting the results and with intellectual input. DKM, SM and AS prepared the draft, which was read, revised and approved by all the authors. The manuscript has been read and approved by all the authors and the requirement of authorship fulfilled by all the authors.
Mothers’ caregiving resources and practices for children under 5 years in the slums of Hyderabad, India: a cross-sectional study

Rajini Peter, K Anil Kumar

ABSTRACT

Background: The extended care model of the United Nations Children’s Fund (UNICEF) identifies knowledge/beliefs, nutritional status, mental health, control of resources/autonomy, workload/time constraints and social support as important caregiver resources for childcare. The aim of this paper is to examine the role of mothers’ caregiving resources in child-care practices in slums.

Methods: A cross-sectional study was conducted in 10 slums of Hyderabad, to appraise the caregiving practices and health status of children under 5 years. Data were collected from 506 households, selected through multistage stratified random sampling, and data relating to 451 children aged 6–59 months were analysed. Four caregiving practices were studied: psychosocial stimulation, as assessed by the Home Observation Measurement of the Environment inventory; hygienic care rated by spot-check observation; and meal frequency and dietary diversity based on maternal recall. The role of the mother’s caregiving resources was examined using bivariate and multivariate logistic regression analyses.

Results: More than 50% of the children received good psychosocial stimulation and close to 60% had good hygienic care. About 75% of the children aged 6–23 months had the recommended minimum meal frequency and 13% had the recommended dietary diversity. Mother’s media exposure (odds ratio [OR] 2.25, 95% confidence interval [CI] 1.35–3.77), participation in household budgeting (OR 2.04, CI 1.28–3.24) were predictors of psychosocial stimulation. Mother’s younger age (OR 1.11, CI 1.04–1.18), poor media exposure (OR 1.95, CI 1.15–3.29), dissatisfaction with life (OR 1.84, CI 1.05–3.24), workload (OR 1.79, CI 1–3.18) and having no money for their own use (OR 1.52, CI 0.95–2.45) placed children at higher odds for receiving poor hygienic care. Leisure time (OR 2.75, CI 1.25–6.06) and participation in budgeting (OR 1.97, CI 1–3.86) were predictors of meal frequency.

Conclusion: Mother’s workload, poor media exposure, dissatisfaction with life, lack of husband’s support and absence of economic autonomy are constraints to good child care in slums.

Key words: caregiving practices, caregiving resources, dietary diversity, hygienic care, meal frequency, psychosocial stimulation, slum
remarkable growth of its urban population and consequently of slums. As per the 2011 Census, one-sixth of all urban households (17.4%) in India are slum households. A recent study has shown that growth in populations living in urban slum conditions increases infant and child mortality rates in developing countries. Studies have shown that the health and nutritional status of children of the urban poor in India are similar or worse than children in rural areas, and that they also receive inadequate care. Hyderabad is a fast-growing metropolitan city in India, with 31.8% of all households in the municipal corporation area residing in slums.

The purpose of this paper is to identify the role of mothers’ caregiving resources on caring practices for children under 5 years in the slum settlements of Hyderabad, India. It is expected that even when poverty and a hazardous environment predispose to undernutrition and ill-health, good caregiving practices will optimize the use of existing resources. It is hypothesized that the mother’s caregiving resources will be significant predictors of child-care practices in slums.

**METHODS**

A cross-sectional survey was conducted in 10 slums of Hyderabad, India, from December 2012 to April 2013, to appraise the caregiving practices, nutritional status and development of children under 5 years of age. Most recent surveys by the Greater Hyderabad Municipal Corporation have estimated the slum population in Hyderabad to be 2 million in listed slums. The population of unlisted slums is estimated at roughly 0.6 million. Data were collected from 506 households with at least one child under 5 years whose mother was alive and staying with the child. If there was more than one child, the last born was selected for data collection. Data from children aged 6–59 months were used. Informed verbal consent was taken from all respondents. Approval from the research and development department of the Tata Institute of Social Sciences was obtained prior to initiation of the study.

The sample size for the child-health survey was estimated as 506, based on the 32.4% prevalence of stunting in Hyderabad.
slum populations reported in the National Family Health Survey-3 (NFHS-3), with confidence level at 95%, 5% margin of error and a design effect of 1.5. There were 451 children aged 6 months and above in this sample, whose data were studied for this paper.

Multistage stratified random sampling was done, ensuring proportional representation of the population from the central as well as peripheral areas of the city and slums, from the government list of slums and unlisted slums. First, three municipal wards from the central region and two wards from the peripheral regions were randomly selected. Ten slums were randomly picked from selected wards: six slums (four listed [two per ward], two unlisted [one per ward]) from the central region; and four slums (three listed [two per ward and one random], one unlisted [random from three wards]) from the peripheral regions of the city. If unlisted slums were not present in the selected wards, the ones located nearby were included. About the same number of households (51 listed/50 unlisted) from each slum were included to reach the sample size of 506.

In order to select mother-child dyads from the slums, a lane was randomly selected to begin the survey and households with under-fives were enrolled in the study. Once the first lane had been surveyed, eligible households from the adjacent lane were approached and so on until the required number for each slum was reached. Children who were acutely ill or had congenital defects, and those whose mothers had migrated to the city in the past 6 months or were not willing to participate in the study were excluded.

The details of household, child and mother characteristics were obtained from personal interviews with the mother. A semistructured interview schedule was developed based on the caregiver and household determinants of child health reported in the literature. The tool was pretested in 25 households. All interviews were conducted in local languages.

The caregiving practices studied were psychosocial stimulation, hygienic care, meal frequency and dietary diversity. Psychosocial stimulation refers to the extent that the environment provides physical stimulation through sensory input, as well as emotional stimulation provided through an affectionate bond between the caregiver and the child. It was measured by the Home Observation Measurement of the Environment-Short Form (HOME-SF), a standardized inventory for measuring the quality of a child’s home environment.

HOME-SF is a modification of the HOME inventory and comprises observation and mother reports measuring emotional support and cognitive stimulation provided to children. It has four parts, one part each for: children under 3 years, those between the ages of 3 and 5 years, ages 6–9 years, and 10 years and older. In the present study, the first two parts were used with slight modifications for the slum population, after translation into the local languages. Hygienic care was assessed by a spot-check observation of 13 hygiene aspects, namely: cleanliness of the mother; the child’s hands and body; the child’s bottom; the child’s play area; the house; the compound; the cooking and serving vessels; observation of whether the child had any underwear; whether drinking-water was kept covered; whether there was any stagnant water in and around the house; whether there was any soap near the hand-washing area; whether there was any detergent near the utensil-washing area; and asking how stool last passed by the child was disposed of. Each positive observation was scored one and a total score was calculated. For assessing feeding practices, the mother was asked to list all foods and liquids consumed by the child in the previous 24 hours.

The mother’s caregiving resources (Table 1) were selected based on UNICEF’s extended care model (Fig. 1). Maternal literacy and media exposure were included as proxies of the mother’s knowledge and beliefs, and body mass index (BMI) indicated nutritional status. Questions were asked about the mother’s happiness and general satisfaction with married life, the financial situation of the family, her own health, and the child’s health and care. A composite score derived by principal component analysis was used as a proxy for measuring the mother’s lack of stress and mental health. Control of resources or financial autonomy of the mother was assessed by asking whether she was currently employed, had money that she alone could decide how to use, and whether she participated in family budgeting. The mother’s workload was assessed by the amount of leisure time available per day and social support obtained from the husband in helping to care for the child and in home tasks. The mother’s age was also included in the resources list, as older age has been proven to be advantageous for child care. Based on previous research, several covariates were considered as potential confounders of the relationship between the mother’s resources and caregiving practices; these are listed and explained in Table 1.

Psychosocial stimulation was evaluated by computing the summated scores of each child derived from the HOME-SF inventory. As the maximum score varies by age (6–35 months, 36–60 months), HOME score quartiles of each group were calculated separately and children were categorized as having high, moderately high, medium or poor HOME scores. Total scores obtained for each child for hygienic care fell into three groups and children were categorized as having good, average or poor hygiene. Minimum meal frequency and dietary diversity are two important indicators proposed by WHO to assess infant and young child feeding of children aged 6–23 months. Hence, for this study, the feeding behaviours of only 248 out of 451 children aged 6–23 months were considered. For breastfed children, the following were considered the minimum requirements: a meal frequency of two times if the child was 6–8 months, and three times if 9–23 months. For non-breastfed children, a frequency of four times for all ages was considered the minimum needed. For calculating dietary diversity, a score based on seven food groups was created. The food groups used for calculation were grains, roots, tubers; legumes and nuts; dairy products; flesh foods; eggs; vitamin A-rich fruits and vegetables; and other fruits and vegetables. For each food group, one point was added to make a final score out of seven; scores more than or equal to four are considered adequate by WHO standards.
### Table 1: Characteristics of children, households and mothers

<table>
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<tr>
<th>Characteristics of children and households</th>
<th>Caregiving resources of mothers</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Age of child (months)</strong></td>
<td><strong>Mother’s age (years; mean=24.83 [SD 3.92])</strong></td>
</tr>
<tr>
<td>6–11</td>
<td>&lt;20</td>
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<tr>
<td>12–23</td>
<td>20–25</td>
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<tr>
<td>24–35</td>
<td>&gt;25</td>
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<td>36–47</td>
<td></td>
</tr>
<tr>
<td>48–59</td>
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<tr>
<td><strong>Sex of child</strong></td>
<td><strong>Body mass index (kg/m²)</strong></td>
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<td>Male</td>
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<tr>
<td>Female</td>
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<td><strong>Child’s birth order</strong></td>
<td><strong>Satisfaction with life</strong></td>
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<tr>
<td>1 or 2</td>
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<tr>
<td>3+</td>
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<tr>
<td><strong>Preceding birth interval (months)</strong></td>
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</tr>
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<td></td>
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<tr>
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<td>Participates in family budgeting</td>
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<tr>
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<td><strong>Food security</strong></td>
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<td>Medium</td>
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<td>First/second quintile</td>
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<tr>
<td><strong>Toilet facilities</strong></td>
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<td>Piped to yard</td>
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<td>Public tap/tanker truck</td>
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<table>
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<tr>
<td>323</td>
<td>71.3</td>
<td>134</td>
<td>29.7</td>
</tr>
<tr>
<td>128</td>
<td>28.4</td>
<td>317</td>
<td>70.3</td>
</tr>
</tbody>
</table>

SD: standard deviation

*mothers were asked how often they were able to read a newspaper or magazine, listen to the radio, watch television and watch films at the cinema, and they were expected to respond as almost every day, at least once a week, less than once a week or not at all; for watching films at the cinema, they were expected to respond as almost every week, at least once a month, less than once a month or not at all. Using principal component analysis (PCA), mass media exposure scores were derived, which were further divided into tertiles to categorize the scores as good, average or poor exposure.

**Food security** was assessed by asking five questions selected from the Household Food Insecurity (Access) scale on the food situation of the past 1 month and tertiles of scores were calculated.

**Wealth index** was calculated as described in National Family Health Survey-3 (NFHS-3), by using PCA to take into account data on source of drinking-water, source of non-drinking water, toilet facilities, electricity, and household possession of car, moped/scooter/motorcycle, telephone, refrigerator, colour television, electric cooler, bicycle, electric fan, radio/transistor; sewing machine, black and white television, computer, water pump, mattress, pressure cooker, chair, sofa set, cot/bed, table and clock/watch; the type of cooking fuel; main material of construction for the floor, roof and wall; type of windows; number of family members per sleeping room; number of family members with a bank or post-office account; and house ownership.
Logistic regression analysis was done to determine the predictors of child-care practices. The role of mother’s caregiving resources was tested using bivariate and multivariate logistic regression. For regression analyses, scores in the two lower quartiles were considered as unsatisfactory outcomes (<62% of the total score) for psychosocial stimulation, and for hygienic care the two lower tertiles (<69% of the total hygiene score) were considered unsatisfactory. As dietary diversity including four groups or more was infrequent in slum children, analysis was done for factors facilitating consumption of at least three food groups. In the bivariate analysis, the association of caregiving practices with each dependent variable was assessed. All variables of interest with a probability value less than 0.30 on bivariate analysis were included in the multivariate analysis. Two models were examined: one with caregiving resources alone, and another controlling for potentially confounding child and household characteristics. The analyses were done using SPSS version 15.0.

RESULTS

Out of 451 children, 248 (55%) were aged 6–23 months, 271 (60%) were male children, 111 (25%) were third or more in birth order, and 70 (16%) had less than 24 months of preceding birth interval. Sixty-nine per cent (311) had fathers who were literate, and 37% (165) had fathers who were unskilled labourers. Most of the children (304 [68%]) belonged to nuclear families. Out of the 451 households, 267 (59%) belonged to the three lower quintiles of the wealth index, 228 households (51%) had doubtful food security and 120 (27%) did not have any toilet. Seventy per cent (317) of households depended on a public tap or tanker trucks for drinking water, and 294 (65%) households were crowded and had to accommodate four or more persons in a sleeping room. About 28% of families were residing in unlisted slums (Table 1).

Regarding the mother’s caregiving resources, the mean age of the mothers was 24.8 ± 3.9 years. About 42% (188) were illiterate, only 156 (35%) had good exposure to the media, and 110 (24%) had a BMI of less than 18.5 kg/m². Despite living in slums, 80% (362) of mothers were generally satisfied and happy with their lives. Out of 451 mothers, only 76 (17%) were employed, 312 (69%) had money of their own that they alone could decide how to use, and 308 (68%) participated in family budgeting. Eighty-four (19%) mothers did not get even 2 hours leisure time per day, and 228 (51%) did not receive any support from their husbands in child care or home tasks (Table 1).

Caregiving practices

Table 2 shows the psychosocial stimulation and hygienic practices of children under 5 years in the slums of Hyderabad, India. Classification of children aged 6–35 months and 36–59 months based on their HOME scores are listed, along with range and mean scores. Among 451 children aged 6–59 months, 122 children (27%) received high cognitive and psychosocial stimulation (78–100% of total scores) at their homes. While another 26% (117) received moderately high levels (65–78% of total scores) of stimulation, the remaining 45% (212) received only poor-to-medium levels (28–61% of total scores) of stimulation in their homes. The hygiene scores of 185 (41%) households were not satisfactory (range 1–9; 8–69% of total scores). Among 248 children aged 6–23 months, 74% (183) received at least the minimum number of feeds/meals required; however, the quality of feeds or dietary diversity of 87% (215) of children was suboptimal (fewer than four food groups) and 55% (137) of children had a diet of items from fewer than three food groups.

Bivariate analysis

Table 3 presents the results of bivariate analyses examining the association between the mothers’ caregiving resources and caregiving practices for children. All mothers’ characteristics except BMI and employment status were associated with psychosocial stimulation. BMI, participation in budgeting and support from husbands were the only factors not associated with hygienic care. Mothers’ literacy, media exposure and satisfaction with life had very strong (P <0.01) associations, and having money for own use had moderately strong (P <0.05) associations with psychosocial stimulation and hygienic care. As to feeding practices for children under 24 months, not many maternal factors demonstrated association. While mothers’ participation in budgeting (P <0.1) and amount of leisure time per day (P <0.05) were associated with meal frequency, media exposure and BMI were weakly associated with dietary diversity (P <0.1).

Table 4 presents the results of bivariate analyses, testing the association of child and household characteristics with caregiving practices. Child’s birth order, preceding birth interval, father’s literacy, occupation, food security, wealth index, toilet facilities, source of drinking water, type of slum and crowding were strongly associated with psychosocial stimulation (P <0.01). In the same way, all the above characteristics except birth interval and crowding (P <0.05), along with family type, were strongly associated (P <0.01) with hygienic care. Child’s age (P <0.01); family type, food security and toilet facilities (P <0.05) were found to influence a child’s meal frequency. Child’s age (P <0.01), wealth index, crowding and source of drinking water (P <0.05) were the factors associated with dietary diversity for children aged 6–23 months.

Multivariate analysis

In model 1 of the multivariate logistic regressions, where all maternal resource variables were included, adjusting for their combined effects on child care, maternal literacy (OR 2.04), media exposure (OR 3.09), participation in family budgeting (OR 1.75) and support from the husband (OR 1.46) retained associations with psychosocial stimulation. Model 2 shows ORs derived after adjusting for the confounding child and household variables, and all except maternal literacy proved to be predictors of psychosocial care: media exposure (OR 2.42; 95% confidence interval [CI] 1.51–3.88), participation in family budgeting (OR 2.19; 95% CI 1.25–3.83) and support from the husband (OR 2.04; 95% CI 1.28–3.24) (Table 5). The association with mothers’ leisure time was not significant (P <0.1) when child and household factors were controlled.
Table 2: Caregiving practices for children aged 6–59 months in the slums of Hyderabad, India

<table>
<thead>
<tr>
<th>Caregiving practice</th>
<th>Number (%)</th>
<th>Range</th>
<th>Mean (SD)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Psychosocial stimulation</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Children aged 6–35 months (N = 335) (maximum score 18)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>High HOME score (first quartile)</td>
<td>91 (27.2)</td>
<td>14–18</td>
<td>15.37 (1.29)</td>
</tr>
<tr>
<td>Moderately high HOME score (second quartile)</td>
<td>93 (27.8)</td>
<td>12–13</td>
<td>12.52 (0.5)</td>
</tr>
<tr>
<td>Medium HOME score (third tertile)</td>
<td>83 (24.8)</td>
<td>10–11</td>
<td>10.53 (0.5)</td>
</tr>
<tr>
<td>Poor HOME score (fourth quartile)</td>
<td>68 (20.3)</td>
<td>5–9</td>
<td>7.96 (1.37)</td>
</tr>
<tr>
<td>Total</td>
<td>335</td>
<td>5–18</td>
<td>11.87 (2.82)</td>
</tr>
<tr>
<td>Children aged 36–59 months (N = 116) (maximum score 23)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>High HOME score (first quartile)</td>
<td>31 (26.7)</td>
<td>18–23</td>
<td>19.61 (1.43)</td>
</tr>
<tr>
<td>Moderately high HOME score (second quartile)</td>
<td>24 (20.7)</td>
<td>15–17</td>
<td>15.96 (0.91)</td>
</tr>
<tr>
<td>Medium HOME score (third tertile)</td>
<td>37 (31.9)</td>
<td>11–14</td>
<td>12.57 (1.21)</td>
</tr>
<tr>
<td>Poor HOME score (fourth quartile)</td>
<td>24 (20.7)</td>
<td>6–10</td>
<td>8.08 (1.35)</td>
</tr>
<tr>
<td>Total</td>
<td>116</td>
<td>6–23</td>
<td>14.22 (4.33)</td>
</tr>
<tr>
<td>Children aged 6–59 months (N = 451)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>High HOME score (first quartile)</td>
<td>122 (27.1)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Moderately high HOME score (second quartile)</td>
<td>117 (25.9)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Medium HOME score (third tertile)</td>
<td>120 (26.6)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Poor HOME score (fourth quartile)</td>
<td>92 (20.4)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>451 (100)</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Hygienic care</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Children aged 6–59 months (N = 451) (maximum score: 13)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Good</td>
<td>266 (59)</td>
<td>10–13</td>
<td>11.57 (1.1)</td>
</tr>
<tr>
<td>Average</td>
<td>141 (31.3)</td>
<td>6–9</td>
<td>7.63 (1.1)</td>
</tr>
<tr>
<td>Poor</td>
<td>44 (9.8)</td>
<td>1–5</td>
<td>3.7 (1.09)</td>
</tr>
<tr>
<td>Total</td>
<td>451</td>
<td></td>
<td>9.57 (2.85)</td>
</tr>
</tbody>
</table>

HOME: Home Observation Measurement of the Environment; SD: standard deviation

With respect to hygienic care, mothers’ age (OR 1.1), literacy (OR 2.31), media exposure (OR 1.95), satisfaction with life (OR 2.14) and leisure time per day (OR 2) maintained associations in model 1. When all covariates were included in the analysis (model 2), maternal literacy showed no significance. Maternal age (OR 1.11; 95% CI 1.04–1.18), media exposure (OR 1.95; 95% CI 1.15–3.29), satisfaction (OR 1.84; 95% CI 1.05–3.24) and leisure time (OR 1.79; 95% CI 1–3.18) were significant predictors of hygiene. Interestingly, the mother having her own money demonstrated a non-significant association (P < 0.1) when child and household factors were controlled. Table 6 shows the multivariate analysis results relating to the feeding practices of children under 2 years. In model 1, leisure time/day (OR 2.47; 95% CI 1.2–5.07) demonstrated a significant association with meal frequency. Association of participation in budgeting was not significant (P < 0.1). None of the maternal factors was significantly associated with children’s dietary diversity except for media exposure and BMI, which showed a non-significant association (P < 0.1). In model 2, available leisure time (OR 2.75; 95% CI 1.25–6.06) and participation in budgeting (OR 1.97; 95% CI 1–3.86) demonstrated significant associations with children’s meal frequency. Except for BMI demonstrating a weak association (OR 1.7; 95% CI 0.92–3.13), none of the maternal factors was associated with dietary diversity. The child’s preceding birth interval and household wealth index were associated with psychosocial stimulation; birth order, wealth index and source of drinking water were associated with hygienic care; family type and the child’s age were associated with meal frequency; and the child’s age was significantly associated with dietary diversity.

**DISCUSSION**

This study was intended to identify the maternal resources or characteristics that influence caregiving practices and to evaluate their relative importance while controlling for household and child factors.

Psychosocial and cognitive stimulation is an important child-rearing practice directly related to child development and this
Table 3: Association of mothers’ caregiving resources with caregiving practices for children: bivariate analyses using logistic regression

<table>
<thead>
<tr>
<th>Caregiving resource of the mother</th>
<th>Psychosocial stimulation</th>
<th>Hygienic care</th>
<th>Meal frequency</th>
<th>Dietary diversity</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Good, % (N = 239) OR (95% CI)</td>
<td>Good, % (N = 266) OR (95% CI)</td>
<td>Minimum, % (N = 183) OR (95% CI)</td>
<td>≥3 food groups, % (N = 111) OR (95% CI)</td>
</tr>
<tr>
<td>Mother’s age (continuous variable)</td>
<td>1.028 (0.98–1.08)</td>
<td>1.08*** (1.03–1.14)</td>
<td>1.05 (0.97–1.14)</td>
<td>1.02 (0.96–1.1)</td>
</tr>
<tr>
<td>Literacy</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Literate</td>
<td>63.5</td>
<td>70.3</td>
<td>76.4</td>
<td>46.6</td>
</tr>
<tr>
<td>Illiterate</td>
<td>38.3</td>
<td>43.1</td>
<td>70</td>
<td>42</td>
</tr>
<tr>
<td>Media exposure</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Good</td>
<td>73.7</td>
<td>75.6</td>
<td>75.6</td>
<td>52.3</td>
</tr>
<tr>
<td>Average/poor</td>
<td>42</td>
<td>50.2</td>
<td>72.8</td>
<td>48.3</td>
</tr>
<tr>
<td>BMI (kg/m²)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>&lt;18.5</td>
<td>49.1</td>
<td>53.6</td>
<td>71.4</td>
<td>35.7</td>
</tr>
<tr>
<td>≥18.5</td>
<td>54.3</td>
<td>60.7</td>
<td>74.7</td>
<td>48.3</td>
</tr>
<tr>
<td>Satisfaction with life</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>56.6</td>
<td>63.8</td>
<td>74.1</td>
<td>46.3</td>
</tr>
<tr>
<td>No*</td>
<td>38.2</td>
<td>39.3</td>
<td>72.1</td>
<td>37.2</td>
</tr>
<tr>
<td>Employed</td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>44.7</td>
<td>47.4</td>
<td>69</td>
<td>55.2</td>
</tr>
<tr>
<td>No*</td>
<td>54.7</td>
<td>61.3</td>
<td>74.4</td>
<td>45.9</td>
</tr>
<tr>
<td>Has own money to use</td>
<td></td>
<td></td>
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<td></td>
</tr>
<tr>
<td>Yes</td>
<td>45.3</td>
<td>51.8</td>
<td>73.7</td>
<td>42.1</td>
</tr>
<tr>
<td>No*</td>
<td>56.4</td>
<td>62.2</td>
<td>73.8</td>
<td>45.9</td>
</tr>
<tr>
<td>Participates in budgeting</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>42.7</td>
<td>58.7</td>
<td>66.7</td>
<td>39.1</td>
</tr>
<tr>
<td>No*</td>
<td>57.8</td>
<td>59.1</td>
<td>77.6</td>
<td>47.8</td>
</tr>
<tr>
<td>Leisure time/day</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2+ h</td>
<td>40.5</td>
<td>46.4</td>
<td>59.5</td>
<td>43.7</td>
</tr>
<tr>
<td>&lt;2 h*</td>
<td>55.9</td>
<td>61.9</td>
<td>76.7</td>
<td>43.7</td>
</tr>
<tr>
<td>Support from husband</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>59.2</td>
<td>61</td>
<td>76.4</td>
<td>42.5</td>
</tr>
<tr>
<td>No*</td>
<td>46.9</td>
<td>57</td>
<td>71.1</td>
<td>47.1</td>
</tr>
</tbody>
</table>

CI: confidence interval; OR: odds ratio; *: P < 0.1; **: P < 0.05; ***: P < 0.01.

a Reference group.

has been corroborated by studies on HOME scores and child development.\(^{15,16}\) HOME scores assess the quality and quantity of support for and stimulation provided to children at home. It has been proved that psychosocial stimulation also promotes children’s growth and nutrition.\(^{17}\) Hygiene practices also play an important role in the health and nutrition of children by reducing infections and promoting appetite, and thereby food intake. A slum study in Kenya demonstrated that good hygiene behaviour reduced the risk of diarrhoea.\(^{18}\)

The present study establishes the mother’s exposure to media and economic autonomy as beneficial for psychosocial stimulation and hygienic care. The media exposes mothers to modern child-care practices and reinforces the importance of hygiene, play, toys and parental involvement in care. For women who live in slums and who barely move out of their homes (the few employed women went to nearby workplaces), television is the most accessed (73%) medium and opens windows to the outer world. It familiarizes the women with the practices and lives of
Table 4: Association of child and household characteristics with caregiving practices for children: bivariate analyses using logistic regression

<table>
<thead>
<tr>
<th>Characteristics of the child and household</th>
<th>Psychosocial stimulation</th>
<th>Hygienic care</th>
<th>Meal frequency</th>
<th>Dietary diversity</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Satisfactory, % (N = 239)</td>
<td>Good, % (N = 266)</td>
<td>Minimum, % (N = 183)</td>
<td>≥3 groups, % (N = 111)</td>
</tr>
<tr>
<td>Age of the child (continuous variable)</td>
<td>1.004 (0.99–1.02)</td>
<td>1.01 (0.99–1.02)</td>
<td>1.13*** (1.06–1.21)</td>
<td>1.2*** (1.06–1.19)</td>
</tr>
<tr>
<td>Birth order</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Birth order 1 or 2</td>
<td>57.6 2.15*** (1.39–3.34)</td>
<td>63.2 2.02*** (1.31–3.12)</td>
<td>73.2 (0.42–1.78)</td>
<td>46.5 1.42 (0.75–2.67)</td>
</tr>
<tr>
<td>Birth order 3+</td>
<td>38.7 (0.96–2.85)</td>
<td>45.9 (0.69–2.02)</td>
<td>76 (0.33–1.78)</td>
<td>38 (0.36–1.54)</td>
</tr>
<tr>
<td>Birth interval (months)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>First born</td>
<td>64 2.83*** (1.56–5.13)</td>
<td>62.5 1.4 (0.78–2.52)</td>
<td>76.5 1.01 (0.41–2.49)</td>
<td>50.6 (0.53–2.45)</td>
</tr>
<tr>
<td>≥24*</td>
<td>51 1.66* (2.02–3.06)</td>
<td>58.4 1.18 (0.77)</td>
<td>71.2 (0.74)</td>
<td>40 (0.74)</td>
</tr>
<tr>
<td>&lt;24*</td>
<td>38.6 (0.96–1.33)</td>
<td>54.3 (0.69–2.02)</td>
<td>76.3 (0.33–1.78)</td>
<td>47.4 (0.36–1.54)</td>
</tr>
<tr>
<td>Father’s literacy</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Literate</td>
<td>61.4 3.05*** (2.01–4.63)</td>
<td>68.2 3.41*** (2.25–5.17)</td>
<td>76.7 (0.9–3.01)</td>
<td>43.8 0.87 (0.5–1.51)</td>
</tr>
<tr>
<td>Illiterate*</td>
<td>34.3 (2.01–4.63)</td>
<td>38.6 (2.25–5.17)</td>
<td>66.7 (0.9–3.01)</td>
<td>47.2 (0.5–1.51)</td>
</tr>
<tr>
<td>Father’s occupation</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Service/skilled</td>
<td>60.5 2.3*** (1.55–3.4)</td>
<td>67.1 2.51*** (1.69–3.72)</td>
<td>74.2 (1.06–1.21)</td>
<td>45.8 1.12 (0.67–1.88)</td>
</tr>
<tr>
<td>Unskilled*</td>
<td>40 (1.55–3.4)</td>
<td>44.8 (1.69–3.72)</td>
<td>73.1 (0.59–1.89)</td>
<td>43 (0.67–1.88)</td>
</tr>
<tr>
<td>Food security</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Good</td>
<td>64.1 2.46*** (1.68–3.59)</td>
<td>71.7 2.92*** (1.98–4.32)</td>
<td>79.9 (1.12–3.52)</td>
<td>49.3 (0.9–2.47)</td>
</tr>
<tr>
<td>Poor*</td>
<td>42.1 (1.68–3.59)</td>
<td>46.5 (1.98–4.32)</td>
<td>66.7 (1.12–3.52)</td>
<td>39.5 (0.9–2.47)</td>
</tr>
<tr>
<td>Wealth index</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1st/2nd quintile</td>
<td>77.2 5.93*** (3.87–9.06)</td>
<td>81 (3.51–8.48)</td>
<td>79.4 (1.66)</td>
<td>52.9 1.76** (1.05–2.93)</td>
</tr>
<tr>
<td>3rd/4th/5th quintile*</td>
<td>36.3 (3.87–9.06)</td>
<td>43.8 (3.51–8.48)</td>
<td>69.9 (0.92–3.02)</td>
<td>39 (1.05–2.93)</td>
</tr>
<tr>
<td>Family type</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Nuclear*</td>
<td>49 1.64*** (1.1–2.45)</td>
<td>54.3 1.85*** (1.22–2.8)</td>
<td>68.5 (1.22–4.58)</td>
<td>42.6 1.29 (0.76–2.18)</td>
</tr>
<tr>
<td>Joint*</td>
<td>61.2 (1.1–2.45)</td>
<td>68.7 (1.22–2.8)</td>
<td>83.7 (1.22–4.58)</td>
<td>48.8 (0.76–2.18)</td>
</tr>
<tr>
<td>No. of people sleeping per room (crowding)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2–3 per room</td>
<td>67.5 2.52*** (1.68–3.77)</td>
<td>66.9 1.67*** (1.11–2.5)</td>
<td>79.3 (0.85–2.94)</td>
<td>54 (1.05–3.02)</td>
</tr>
<tr>
<td>4+ per room                             *</td>
<td>45.2 (1.68–3.77)</td>
<td>54.8 (1.11–2.5)</td>
<td>70.8 (0.85–2.94)</td>
<td>39.8 (1.05–3.02)</td>
</tr>
<tr>
<td>Toilet facilities</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Improved</td>
<td>58.3 2.25*** (1.47–3.45)</td>
<td>67.1 3.52*** (2.27–5.44)</td>
<td>78 (2.16** 47.8 1.6)</td>
<td>48 (0.9–2.86)</td>
</tr>
<tr>
<td>Open field*</td>
<td>38.3 (1.47–3.45)</td>
<td>36.7 (2.27–5.44)</td>
<td>62.1 (1.18–3.98)</td>
<td>36.4 (0.9–2.86)</td>
</tr>
<tr>
<td>Drinking water</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Piped</td>
<td>65.7 2.1*** (1.38–3.2)</td>
<td>79.9 3.94*** (2.45–6.34)</td>
<td>77.5 (0.72–2.5)</td>
<td>53.8 1.71** (1–2.92)</td>
</tr>
<tr>
<td>Public tap/truck*</td>
<td>47.6 (1.38–3.2)</td>
<td>50.2 (2.45–6.34)</td>
<td>72 (0.72–2.5)</td>
<td>40.5 (1–2.92)</td>
</tr>
<tr>
<td>Type of slum</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Listed</td>
<td>57.3 1.84*** (1.21–2.78)</td>
<td>65.6 2.62*** (1.72–3.98)</td>
<td>76.3 (1.54)</td>
<td>45.8 1.15 (0.66–2.01)</td>
</tr>
<tr>
<td>Unlisted*</td>
<td>42.2 (1.21–2.78)</td>
<td>42.2 (1.72–3.98)</td>
<td>67.6 (0.84–2.82)</td>
<td>42.3 (0.66–2.01)</td>
</tr>
</tbody>
</table>

CI: confidence interval; OR: odds ratio; *: P < 0.1; **: P < 0.05; ***: P < 0.01.

a Reference group

their counterparts in higher socioeconomic groups, and these subsequently affect their behaviour. Exposure to television and radio were found to be more effective than community events in raising awareness about hand-washing in Ghana. Media exposure has also proved to be an important factor for good feeding practices for children in India, Ethiopia and Sri Lanka and this underscores it as an important resource for women.

Autonomy in financial matters gives women the freedom to allocate money for items they consider important. Involvement in the family budget allows a woman to allocate resources for child-care equipment, and having money in her hand will allow her to use it for items such as soap when they are needed rather than depending on her husband. It will instil a sense of accountability in the mother that will positively affect the quality of child care. This is supported by a study proving that women’s autonomy is beneficial for children’s nutrition.
Table 5. Predictors of satisfactory psychosocial stimulation and good hygienic care for children aged 6–59 months in the slums of Hyderabad, India: logistic regression (multivariate with alternative models)

<table>
<thead>
<tr>
<th>Mothers’ caregiving resources</th>
<th>Psychosocial stimulation</th>
<th>Hygienic care</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Model 1(^{a}), OR (95% CI)</td>
<td>P value</td>
</tr>
<tr>
<td>Mother’s age</td>
<td>–</td>
<td>–</td>
</tr>
<tr>
<td>BMI (kg/m(^2)) ≥18.5</td>
<td>–</td>
<td>–</td>
</tr>
<tr>
<td>&lt;18.5(^{a})</td>
<td>2.04 (1.34–3.13)</td>
<td>0.00</td>
</tr>
<tr>
<td>Literacy</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Literate(^{a})</td>
<td>3.09 (1.95–4.88)</td>
<td>0.00</td>
</tr>
<tr>
<td>Literate(^{a})</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Media exposure</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Good</td>
<td>1.36 (0.81–2.3)</td>
<td>0.25</td>
</tr>
<tr>
<td>Average/poor(^{a})</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Satisfaction with life</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>2.03 (1.09–3.78)</td>
<td>0.25</td>
</tr>
<tr>
<td>No(^{a})</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Leisure time/day</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2+ h</td>
<td>1.1 (0.7–1.82)</td>
<td>0.72</td>
</tr>
<tr>
<td>&lt;2 h(^{a})</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Has money of their own to spend</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>1.75 (1.06–2.89)</td>
<td>0.03</td>
</tr>
<tr>
<td>No(^{a})</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Participates in budgeting</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>1.1 (0.6–2.3)</td>
<td>0.69</td>
</tr>
<tr>
<td>No(^{a})</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Employed</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>1.46 (0.97–2.2)</td>
<td>0.07</td>
</tr>
<tr>
<td>No(^{a})</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Support from husband</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>1.14 (0.68–1.91)</td>
<td>0.20</td>
</tr>
<tr>
<td>No(^{a})</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Covariates: child, household characteristics</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Birth interval (months)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>First born</td>
<td>1.69 (0.77–3.72)</td>
<td>0.19</td>
</tr>
<tr>
<td>≥24</td>
<td>2.14 (1.11–4.13)</td>
<td>0.02</td>
</tr>
<tr>
<td>&lt;24(^{a})</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Birth order</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1/2</td>
<td>1.54 (0.89–2.67)</td>
<td>0.13</td>
</tr>
<tr>
<td>3+(^{a})</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Father’s literacy</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Literate(^{a})</td>
<td>1.44 (0.68–1.91)</td>
<td>0.20</td>
</tr>
<tr>
<td>Illiterate(^{a})</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Father’s occupation</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Service/skilled</td>
<td>1.16 (0.69–1.95)</td>
<td>0.58</td>
</tr>
<tr>
<td>Unskilled(^{a})</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Wealth index</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1st/2nd quintile</td>
<td>3.97 (2.24–7.05)</td>
<td>0.00</td>
</tr>
<tr>
<td>3/4/5th quintile(^{a})</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Family type</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Nuclear(^{a})</td>
<td>1.14 (0.68–1.91)</td>
<td>0.63</td>
</tr>
<tr>
<td>Joint</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Support by the husband, shown to be a positive factor for psychosocial stimulation, is a morale booster for women, providing companionship and extra time, and thereby improving the quality of child care. Its effect was shown to be larger in the second model, reiterating that if child and family characteristics remain constant, support by the husband is an important determinant of the quality of child care. Socioeconomic status and parental education have been found to be consistently associated with the quality of child care. It reflects the absence of stress and anxiety, and psychological well-being. The mother’s mental health or presence of a mental disorder has been established as an important determinant of child health and nutrition in countries including India, and the pathway for mental health to child health and nutrition will be through child care. The mother’s satisfaction with life was found to be beneficial for hygiene in this study, and this suggests to the possibility of infections when satisfaction is lacking.

While age, literacy, workload, support by the husband and participation in budgeting showed a connection with meal frequency; media exposure, BMI, satisfaction, employment and participation in budgeting were loosely connected with dietary diversity. This is probably because dietary quantity needs time and support to use the food already available, while quality requires a conscious initiative from the mother. The multivariate analyses found workload and budget participation to be associated with meal frequency, but it did not find any maternal factor associated with dietary diversity. Financial autonomy has been proven to be beneficial for child feeding.

It was very hard for employed women in slums to find time for child care. Unsurprisingly, children belonging to nuclear families were at higher odds for not having minimum meals, which underscores the need for community support systems for working mothers in slums.

This study of a representative sample from the slum population of Hyderabad investigated caring practices of a fairly large age group of children (6–59 months). A major limitation was that there was only one observation set for all practices.

In order for the care received by slum children to be improved, their mothers should be exposed to the media and have more financial autonomy. Health messages through media and context-specific empowerment programmes might also help. Encouraging the husband’s involvement in child care and mobilizing community support systems for slum women will also be beneficial.

A focus on caregiving practices without concern for resources might lead to the unfortunate result of accusing the mothers of inadequate child care, rather than recognizing a lack of resources available to them. Policy-makers will find the above-mentioned measures less capital intensive and more effective in building a resurgent slum populace.

<table>
<thead>
<tr>
<th>Mothers’ caregiving resources</th>
<th>Psychosocial stimulation</th>
<th>Hygienic care</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Model 1: OR (95% CI)</td>
<td>P value</td>
</tr>
<tr>
<td>No. of people sleeping per room (crowding)</td>
<td></td>
<td>P value</td>
</tr>
<tr>
<td>2–3</td>
<td>1.67 (0.94–2.98)</td>
<td>.08</td>
</tr>
<tr>
<td>4+</td>
<td>0.96 (0.59–1.57)</td>
<td>0.86</td>
</tr>
<tr>
<td>Toilet</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Improved</td>
<td>1.2 (0.68–2.12)</td>
<td>0.53</td>
</tr>
<tr>
<td>Open field*</td>
<td>1.53 (0.89–2.65)</td>
<td>0.13</td>
</tr>
<tr>
<td>Drinking-water</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Piped</td>
<td>1.02 (0.59–1.77)</td>
<td>0.93</td>
</tr>
<tr>
<td>Not piped*</td>
<td>2.11 (1.2–3.71)</td>
<td>0.01</td>
</tr>
</tbody>
</table>

CI: confidence interval; OR: odds ratio.

a Reference category; b Model 1: regression model with mother’s caregiving resources alone; c Model 2: full model including child and household variables; ∅ not included in the regression models as these variables were not significant in bivariate analyses.
Table 6. Predictors of minimum meal frequency and dietary diversity (≥3 food groups) in children aged 6–23 months in the slums of Hyderabad, India: logistic regression analysis (multivariate with alternative models)

<table>
<thead>
<tr>
<th>Mothers' caregiving resources</th>
<th>Meal frequency</th>
<th>Dietary diversity</th>
<th>P value</th>
<th>P value</th>
<th>P value</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Model 1&lt;sup&gt;b&lt;/sup&gt;, OR (95% CI)</td>
<td>Model 2&lt;sup&gt;c&lt;/sup&gt;, OR (95% CI)</td>
<td>P value</td>
<td>Model 1&lt;sup&gt;b&lt;/sup&gt;, OR (95% CI)</td>
<td>P value</td>
</tr>
<tr>
<td>Mother's media exposure</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Good</td>
<td>–</td>
<td>–</td>
<td>–</td>
<td>1.61 (0.94–2.75)</td>
<td>0.085</td>
</tr>
<tr>
<td>Average/ poor&lt;sup&gt;a&lt;/sup&gt;</td>
<td></td>
<td></td>
<td></td>
<td>1.67 (0.94–2.3)</td>
<td>0.083</td>
</tr>
<tr>
<td>BMI (kg/m²)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>&lt;18.5&lt;sup&gt;a&lt;/sup&gt;</td>
<td></td>
<td></td>
<td></td>
<td>1.27 (0.63–2.57)</td>
<td>0.5</td>
</tr>
<tr>
<td>≥18.5</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Satisfaction with life</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td></td>
<td></td>
<td></td>
<td>1.59 (0.71–3.52)</td>
<td>0.26</td>
</tr>
<tr>
<td>No&lt;sup&gt;a&lt;/sup&gt;</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Employed</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td></td>
<td></td>
<td></td>
<td>1.66 (0.91–3.03)</td>
<td>0.098</td>
</tr>
<tr>
<td>No&lt;sup&gt;a&lt;/sup&gt;</td>
<td></td>
<td></td>
<td></td>
<td>1.06 (0.97–1.17)</td>
<td>0.21</td>
</tr>
<tr>
<td>Mother's age</td>
<td></td>
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<tr>
<td>Literacy</td>
<td></td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Literate</td>
<td></td>
<td></td>
<td></td>
<td>1.43 (0.8–2.57)</td>
<td>0.23</td>
</tr>
<tr>
<td>Illiterate&lt;sup&gt;a&lt;/sup&gt;</td>
<td></td>
<td></td>
<td></td>
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<td></td>
</tr>
<tr>
<td>Leisure time/day</td>
<td></td>
<td></td>
<td></td>
<td>2.83 (1.3–6.2)</td>
<td>0.014</td>
</tr>
<tr>
<td>≥2 h&lt;sup&gt;a&lt;/sup&gt;</td>
<td></td>
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</tr>
<tr>
<td>&lt;2 h&lt;sup&gt;a&lt;/sup&gt;</td>
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<tr>
<td>Support from husband</td>
<td></td>
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</tr>
<tr>
<td>Yes</td>
<td></td>
<td></td>
<td></td>
<td>1.21 (0.68–2.18)</td>
<td>0.52</td>
</tr>
<tr>
<td>No&lt;sup&gt;a&lt;/sup&gt;</td>
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<tr>
<td>Covariates: child, household characteristics</td>
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<td></td>
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<tr>
<td>Father's literacy</td>
<td></td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Literate</td>
<td></td>
<td></td>
<td></td>
<td>1.44 (0.67–3.12)</td>
<td>0.35</td>
</tr>
<tr>
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<td></td>
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<tr>
<td>Family type</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Nuclear&lt;sup&gt;a&lt;/sup&gt;</td>
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<td></td>
<td></td>
<td>2.9 (1.36–6.2)</td>
<td>0.006</td>
</tr>
<tr>
<td>Joint</td>
<td></td>
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<tr>
<td>Child's birth order</td>
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<td></td>
</tr>
<tr>
<td>1 or 2</td>
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</tr>
<tr>
<td>3&lt;sup&gt;a&lt;/sup&gt;</td>
<td></td>
<td></td>
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<tr>
<td>Age of the child</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>1 year&lt;sup&gt;a&lt;/sup&gt;</td>
<td></td>
<td></td>
<td></td>
<td>1.15 (1.07–1.24)</td>
<td>0.00</td>
</tr>
<tr>
<td>2&lt;sup&gt;a&lt;/sup&gt;</td>
<td></td>
<td></td>
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<tr>
<td>Food security&lt;sup&gt;a&lt;/sup&gt;</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Good</td>
<td></td>
<td></td>
<td></td>
<td>1.65 (0.86–3.17)</td>
<td>0.13</td>
</tr>
<tr>
<td>Poor&lt;sup&gt;a&lt;/sup&gt;</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>No. of people sleeping per room (crowding)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2–3&lt;sup&gt;a&lt;/sup&gt;</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4&lt;sup&gt;a&lt;/sup&gt;</td>
<td></td>
<td></td>
<td></td>
<td>1.32 (0.65–2.67)</td>
<td>0.44</td>
</tr>
<tr>
<td>Type of slum</td>
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<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Listed</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Unlisted&lt;sup&gt;a&lt;/sup&gt;</td>
<td></td>
<td></td>
<td></td>
<td>1.05 (0.5–2.2)</td>
<td>0.91</td>
</tr>
<tr>
<td>CI: confidence interval; OR: odds ratio.</td>
<td></td>
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<td></td>
</tr>
</tbody>
</table>

<sup>a</sup> Reference category; <sup>b</sup> Model 1: regression model with mother's caregiving resources alone; <sup>c</sup> Model 2: full model including child and household variables; –: not included in the regression models as these variables were not significant in bivariate analyses.


ABSTRACT

Introduction: Thailand conducted a national laboratory assessment of core capacities related to the International Health Regulations (IHR) (2005), and thereby established a baseline to measure future progress. The assessment was limited to public laboratories found within the Thai Bureau of Quality and Safety of Food, National Institute of Health and regional medical science centres.

Methods: The World Health Organization (WHO) laboratory assessment tool was adapted to Thailand through a participatory approach. This adapted version employed a specific scoring matrix and comprised 16 modules with a quantitative output. Two teams jointly performed the on-site assessments in December 2010 over a two-week period, in 17 public health laboratories in Thailand. The assessment focused on the capacity to identify and accurately detect pathogens mentioned in Annex 2 of the IHR (2005) in a timely manner, as well as other public health priority pathogens for Thailand.

Results: Performance of quality management, budget and finance, data management and communications was considered strong (>90%); premises quality, specimen collection, biosafety, public health functions, supplies management and equipment availability were judged as very good (>70% but ≤90%); while microbiological capacity, staffing, training and supervision, and information technology needed improvement (>60% but ≤70%).

Conclusions: This assessment is a major step in Thailand towards development of an optimized and standardized national laboratory network for the detection and reporting of infectious disease that would be compliant with IHR (2005). The participatory strategy employed to adapt an international tool to the Thai context can also serve as a model for use by other countries in the Region. The participatory approach probably ensured better quality and ownership of the results, while providing critical information to help decision-makers determine where best to invest finite resources.

Key words: Laboratory assessment, International Health Regulations, Thailand

INTRODUCTION

The revised International Health Regulations (IHR) (2005) is a critical legal document that focuses on ensuring national public health core capacities, as well as a coordinated and effective response to public health emergencies that may have international dimensions. Laboratory capacity and capabilities are a critical component of IHR (2005) and must be part of comprehensive planning of national as well as international public health response plans. Standardized assessment is key to the development of comprehensive and integrated laboratory capacity, and tracking progress and use of tools...
such as those developed by the World Health Organization (WHO) is a preferred method. Thailand, an upper-middle-income country in the WHO South-East Asia Region, and part of recent outbreaks of international importance, has a robust national public health system, including a comprehensive network of laboratories. To guide the development and to provide a framework for strategic investment, the Ministry of Public Health (MOPH), in collaboration with international partners, conducted a comprehensive evaluation of its public health laboratory (PHL) system in 2010. This evaluation used a laboratory assessment tool (LAT) developed by WHO. The assessed laboratories included the National Institute of Health (NIH) and Bureau of Quality and Safety of Food (BQSF) at the national level and functioning as reference laboratories, and 14 regional medical science centres (RMSCs) that are part of the national PHL network. The RMSCs are located in provinces throughout Thailand.

This paper reports the results of this assessment and discusses the implications of using this approach to guide the strengthening of PHL capacity in Thailand, with implications for other countries, to meet the requirements of IHR (2005).

### METHODS

The LAT for facilities was developed by WHO and employs a specific scoring matrix comprising 16 modules, 15 of which had a quantitative output (the general information module is qualitative). Additionally, there was a general indicator score that was the average of all modules. The LAT is a generic, prototype tool for assessment, and requires adaptation to each country’s laboratory systems and facilities. Modules included in the assessment were:

- **general information**: name and address and overall type of analyses performed (qualitative output);
- **premises quality**: condition of the premises and availability of utilities (quantitative output);
- **specimen collection**: quality of samples received, availability of sampling procedures, sample tracking and shipment (quantitative output);
- **biosafety**: premises safety, training and procedures, and equipment (quantitative output);
- **quality management**: availability of written procedures, quality-control procedures and accreditation (quantitative output);
- **public health functions**: contact with IHR focal point, participation in disease surveillance, and notification and reporting (quantitative output);
- **supplies management**: availability and quality of supplies (quantitative output);
- **equipment availability**: availability and quality of equipment (quantitative output);
- **budget and finance**: availability of funds (quantitative output);
- **data management**: data recording and reporting, as well as data protection and back-up (quantitative output);
- **microbiological capacity**: capacity and capability to identify and ship selected pathogens (quantitative output);
- **staffing**: staff availability in the laboratory (quantitative output);
- **training and supervision**: job training, continuing education and availability of e-learning (quantitative output);
- **information technology**: availability of laboratory information systems, computer access and internet availability (quantitative output);
- **communications**: internal (laboratory meetings) and external communications (customers, patients, clinicians, and public health services), as well as capacity (availability of phone, fax, and computer) (quantitative output);
- **gap**: identification of the critical needs and limitations within the laboratory systems and their components (quantitative output).

Each module in the LAT had between three and ten indicators. The indicators consisted of several closed questions, which automatically generated a score. For example, “Yes” had a score of 100 and “No” had a score of 0. An “NA” response was not included in the calculations. Some questions had a response of 1 (33.3%), 2 (66.6%) or 3 (100.0%). The module score that is presented is the average of each indicator included in the given module. The 16th module, the gap module, included 18 questions with responses ranging from 0 (positive impact) to 5 (negative impact). These questions were broad aimed at identifying the greatest needs in the laboratory. Finally, there is a general indicator score that is the average of all modules.

The WHO LAT was adapted to Thailand through a participatory process within the MOPH, and in collaboration with the United States (US) Centers for Disease Control and Prevention (CDC) and WHO, which included the following:

- formation of a working group;
- the working group deleted, added and/or modified indicators and questions within each module, to make the LAT relevant to Thailand. Specifically, many questions were made broader, to include BQSF sampling and diagnostics (environmental samples);
- the working group identified the equipment and diagnostic services required at the different tiers within the PHL system. The modules “microbiological capacity” and “equipment availability” were modified to reflect the different levels of services;
- the module “microbiological capacity” was modified to include shipping and/or diagnostics for selected pathogens listed in IHR (2005). The pathogens included *Vibrio cholerae, Yersinia pestis,* smallpox virus, severe acute respiratory syndrome, viruses causing viral haemorrhagic fevers, West Nile fever virus, and *Bacillus anthracis*, as well as diseases of regional and/or national concern: enteroviruses, *Shigella* and *Salmonella, Streptococcus.*
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**RESULTS**

Overall, Thailand PHLs scored well on the assessment, as demonstrated by the means of the general indicator and of each module (see Table 1). Detailed data for six selected modules (biosafety, quality management, public health functions, microbiological capacity, information technology, and communications) are presented in Figure 1. They were chosen because they represented an overview of the laboratories in Thailand and of the type of data that were collected during the assessment.

Four modules – quality management, budget and finance, data management, and communications – were judged as strong (>90%). Six modules were judged as very good (>70% but ≤90%): premises quality, specimen collection, biosafety, public health functions, supplies management, and equipment availability. Four modules were judged as needing improvement (>60% but ≤70%): microbiological capacity, staffing, training and supervision, and information technology.

The detailed findings from this assessment are presented next.

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**Table 1. Composite assessment scores (%) for individual modules and the general indicator**

<table>
<thead>
<tr>
<th>Category</th>
<th>Overall mean score</th>
<th>National-level mean score (range)</th>
<th>RMSCs mean score (range)</th>
</tr>
</thead>
<tbody>
<tr>
<td>General indicator</td>
<td>83.0</td>
<td>84.7 (81–87)</td>
<td>82.8 (66–88)</td>
</tr>
<tr>
<td>Premises quality</td>
<td>87.2</td>
<td>79.3 (66–91)</td>
<td>88.9 (44–100)</td>
</tr>
<tr>
<td>Specimen collection</td>
<td>86.7</td>
<td>84.3 (80–90)</td>
<td>87.2 (64–98)</td>
</tr>
<tr>
<td>Biosafety</td>
<td>86.9</td>
<td>76.7 (71–85)</td>
<td>89.1 (71–97)</td>
</tr>
<tr>
<td>Quality management</td>
<td>94.1</td>
<td>94.3 (91–100)</td>
<td>94.0 (78–100)</td>
</tr>
<tr>
<td>Public health functions</td>
<td>84.0</td>
<td>80.0 (65–94)</td>
<td>84.9 (54–100)</td>
</tr>
<tr>
<td>Supplies management</td>
<td>89.8</td>
<td>85.3 (77–90)</td>
<td>90.8 (81–97)</td>
</tr>
<tr>
<td>Equipment availability</td>
<td>86.4</td>
<td>93.0 (89–100)</td>
<td>85.0 (62–99)</td>
</tr>
<tr>
<td>Budget and finance</td>
<td>94.6</td>
<td>81.7 (45–100)</td>
<td>97.4 (90–100)</td>
</tr>
<tr>
<td>Data management</td>
<td>91.8</td>
<td>89.3 (78–96)</td>
<td>92.3 (74–100)</td>
</tr>
<tr>
<td>Microbiological capacity</td>
<td>66.0</td>
<td>97.7 (93–100)</td>
<td>59.2 (24–97)</td>
</tr>
<tr>
<td>Staffing</td>
<td>68.4</td>
<td>83.3 (67–100)</td>
<td>65.2 (17–100)</td>
</tr>
<tr>
<td>Training and supervision</td>
<td>67.0</td>
<td>78.3 (74–82)</td>
<td>64.6 (38–96)</td>
</tr>
<tr>
<td>Information technology</td>
<td>70.0</td>
<td>61.0 (53–70)</td>
<td>71.9 (42–92)</td>
</tr>
<tr>
<td>Communications</td>
<td>90.1</td>
<td>98.3 (95–100)</td>
<td>88.4 (74–100)</td>
</tr>
</tbody>
</table>

RMSC, regional medical science centres.

**Biosafety**

Several areas of biosafety were assessed, including availability of training, written procedures, availability and use of personal protective equipment and premises safety, as well as sterilization procedures and waste disposal. As shown in Table 1, overall, the laboratories scored very well (mean score 86.9%). The waste disposal (91.7% and 94.1%, respectively, for national laboratories and RMSCs) and PPE availability indicators (93.3% and 96.8%, respectively, for national laboratories and RMSCs) had the highest overall scores, while the premises safety (44.3% and 81.6%, respectively, for national laboratories and RMSCs) and PPE use (50.0% and 82.9%, respectively, for national laboratories and RMSCs) scored the lowest (see Figure 1).

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The modified LAT is available online: Peruski et al.: IHR (2005) and laboratory capacity in Thailand online-only supplementary material.
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Figure 1: Conceptual framework

**a. Average biosafety score on the LAT.** The indicators are as follows: PS, premises safety; PPEa, availability of personal protective equipment; PPEu, use of personal protective equipment; AP, availability of procedures; ST, safety training; LS, laboratory safety conditions; ES, equipment disinfection and sterilization; St, sterilization; WD, waste disposal; SH, staff health services.

**b. Average quality management score on the LAT.** The indicators are as follows: WP, written procedure; QP, quality of procedures; IQ, internal quality control; EQ, external quality control; SA, standards and accreditation; AA, audits and assessments; CS, customer satisfaction; EM, error management.

**c. Average public health functions score on the LAT.** The indicators are as follows: IHR, relationship with IHR; DS, disease surveillance; SS, sampling and shipping; NR, notification and reporting.

**d. Average microbiological capacity score on the LAT.** The indicators are as follows: S, sampling; VC, *Vibrio cholerae*; SS, *Shigella* and *Salmonella*; SP, *Streptococcus pneumoniae/suis*; YP, *Yersinia pestis*; LP, *Legionella pneumophila*; BA, *Bacillus anthracis*; Li, *Leptospira interrogans*; SM, smallpox virus; SARS, severe acute respiratory syndrome; VHF, viruses causing viral haemorrhagic fevers; WN, West Nile virus; Ent, enterovirus; Den, dengue viruses; Chik, chikungunya virus; FW, food and water samples; Env, environmental sampling.

**e. Average information technology score on the LAT.** The indicators are as follows: IT, information technology hardware and internet connections; LIMS, availability and use of laboratory information system.

**f. Average communications score on the LAT.** The indicators are as follows: IC, internal communications; DM, document management; EC, external communications; CCu, communications with customers; CCa, communications capacity.
Quality management

This module examined the quality of diagnostic procedures by evaluating process control, written procedures and internal and external quality control. As shown in Table 1, the laboratories scored very high in all areas (mean score 94.1%). The quality of procedures (100% and 99.0%, respectively, for national laboratories and RMSCs) and customer satisfaction (100% for both national laboratories and RMSCs) had the highest overall scores, while external quality control (66.7% and 82.6%, respectively, for national laboratories and RMSCs) had the lowest overall scores (see Figure 1).

Public health functions

The primary aim of this module was to assess the ability of the laboratory to interact with, and participate in, surveillance and disease outbreaks, as well as their relationship with the IHR focal point (number of meetings and the degree of information exchange with the IHR focal point). All laboratories scored very well in public health functions (mean score 84.0%; see Table 1). In particular, the laboratories scored very high in the disease surveillance indicators (97.3% and 92.5%, respectively, for national laboratories and RMSCs), while the relationship with IHR focal points (62.7% and 71.0%, respectively, for national laboratories and RMSCs) had the lowest overall score in this module (see Figure 1).

Microbiological capacity

This module assessed the laboratories’ capacity to perform specified viral and microbiological laboratory tests and/or their ability to transport specimens at the appropriate biosafety level. Diagnostics were assessed for pathogens specified in Annex 2 of the IHR (2005), as well as several key endemic pathogens. Of note for this module is that the diagnostic capacity assessed was modified to the level of laboratory within the public health system. For example, for viral haemorrhagic fever, the RMSCs were only assessed on their ability to collect and transport these pathogens to the national laboratories.

As shown in Table 1, microbiological capacity in Thailand should be strengthened (mean score 66.0%). The highest score was in the sampling capacities indicator (100% and 98.2%, respectively, for national laboratories and RMSCs). Laboratories had the lowest score in the capacity to detect/identify Legionella pneumophila (80.0% and 28.9%, respectively, for national laboratories and RMSCs) and viral haemorrhagic fevers (100% and 28.6%, respectively, for national laboratories and RMSCs). Of note in this module is the difference in sample shipment questions. Most laboratories scored 100% in the capacity to ship low-risk clinical samples to the national level. However, most laboratories scored 0% in the capacity to ship high-risk samples (biosafety level 3 pathogens) to the national level. Finally, while the mean score is presented for all indicators, there is a large range of scores for this module.

Information technology

This module assessed the laboratory information management systems, as well as the computer availability and internet connectivity. As shown in Table 1, the mean score for this module was 70.0%. The laboratories scored very well on the computer hardware and internet connectivity indicator (89.0% and 88.0%, respectively, for national laboratories and RMSCs) but scored much lower with regard to availability and actual use of laboratory information management systems (33.3% and 55.6%, respectively, for national laboratories and RMSCs). That is, most laboratories still use paper to report and track samples and results.

Communications

Assessment of laboratory communications included both internal and external communications, such as electronic library (e-library) systems, communications with other laboratories, and communications with customers. Additionally, this module assessed the laboratory’s communication capacity (availability of phone, fax and computers). The aim of this module was to assess the ability of the laboratory to communicate internally and externally (through meetings, newsletters and publications) and how these communications were carried out (phone, fax, or electronically). As shown in Table 1, the laboratories scored very high in all areas (mean score 90.1%). The external communications and capacity indicators had the highest overall scores (100% for both national laboratories and RMSCs), while the documents (access to e-library) indicator (91.7% and 60.7%, respectively, for national laboratories and RMSCs) had the lowest overall score (see Figure 1).

The gap module (data not shown) posed questions that were broad and aimed at identifying the greatest needs in the laboratory; thus, the findings were more variable across the sites assessed. Most sites reported the need to strengthen human resources. For example, at the national level, the number of permanent staff was capped at insufficient levels; thus, temporary staff were employed, which resulted in a high turnover rate of employees. Additionally, many laboratories reported the need for improvements in the laboratory information management systems. As strengths, most sites reported that they had a good organizational structure and network of laboratories, as well as good sample quality.

DISCUSSION

This assessment of Thailand’s PHLs mapped the locations and areas serviced by all RMSCs, NIH and BQSF, using a participatory approach to determine national laboratory core capacities as they relate to IHR (2005). Additionally, 11 Thai nationals were trained as laboratory assessors and successfully completed the assessment, and a fully bilingual, customized LAT was developed. Using this LAT, the assessment found that quality management, budget and finance, data management, and communications scored very high (~90%); premises quality, specimen collection, biosafety, public health functions, supplies management and equipment availability were judged
as very good (>70% but ≤90%); and microbiological capacity, staffing, training and supervision, and information technologies were judged as needing improvement (>60% but ≤70%). Of note is that the quality management module achieved a very high score (94.1%). This is probably the result of in-service training supported by the MOPH and the development of a national laboratory accreditation programme to ensure the quality of laboratory services. ^5

All laboratories scored similarly on the modules; however, some major differences between laboratories are noteworthy. The national laboratories scored much lower in the biosafety module for questions concerning premises safety. This was primarily due to lack of space or poor space utilization in these laboratories. Additionally, while all laboratories had access to PPE, personnel at the national laboratories were much less likely to consistently use it. The assessment also revealed insufficient awareness of IHR among laboratory staff, and a lack of clear and systematic linkage with the officially designated national IHR focal point based in the Bureau of Epidemiology. The large range in scores in this section resulted from some laboratories being more aware than others of IHR. Surveillance functions as linkages between the laboratories and Thailand’s surveillance system were weak. While Thailand has a strong public health network, it needs to strategically link its laboratory system with its surveillance system (often referred to as the “506-reporting system”). The 506-reporting system is a health-care-based system. To date, no mechanism exists within Thailand to electronically link strategic information from the two systems, representing a major inefficiency and missed opportunity. It also had a large range in scores, resulting mainly from the fact that some laboratories lacked laboratory information systems, while others had developed internal home-grown systems. Finally, the assessment found major differences in microbiological services offered for selected pathogens, and identified underutilization of the RMSCs. The low volume of samples analysed and the number of tests performed provided clear evidence of this underutilization. The range of microbiological laboratory services and underutilization of the RMSCs is probably the result of Thailand’s lack of clear definitions of roles, responsibilities and services for each level of laboratory as part of its national PHL system. Additionally, an efficient and safe sample-transfer system is greatly needed to transport high-risk pathogens from RMSCs to national-level laboratories, for reference testing during public health emergencies.

Strengths of this assessment included: the formation of a working group with tripartite interactions between the MOPH and its major collaborators – WHO and US CDC. This encouraged country ownership of the assessment process and application of the results for improving the national PHL system. Additionally, the schedule of travel for the assessment teams was well coordinated, and a thorough review of the laboratories’ capacities under IHR (2005) was obtained. Finally, national assessors were trained and they can periodically re-review the laboratories to measure changes and progress, as well as refine recommendations.

Challenges of this assessment included insufficient time allowed during the pre-assessment phase to customize the LAT. This affected the translation of the tool and validation of the translation. As a result, the LAT was further modified during the assessment, to further refine language usage. Finally, the number of questions and categories included in the LAT could be consolidated and the time spent at each laboratory increased to 2 days, to permit a more in-depth assessment and improve findings and recommendations.

While the findings of this study highlighted strengths and weaknesses of the national laboratory system as a whole, and of individual laboratories, the quantitative scores are not comparable to those of other countries because of the country-specific nature of the scoring matrix in the customized LAT. The authors’ experience of adapting the LAT to the Thai context demonstrates that the generic WHO LAT is sufficiently flexible to assess country-specific laboratory public health capacity. Here, the customized LAT that was developed for this study focused on laboratory capacity relevant to the IHR (2005); ^1 however, the LAT could also be used to meet broader health-system goals, ^6-9 such as the Millennium Development Goals, ^10 or in a more focused manner for specific public health initiatives.

IHR (2005) obliges countries to establish relevant public health core capacity, which includes laboratory core capacity as part of a global effort to ensure global public health security. Health laboratories have long been considered an essential component for evidence-based clinical care. In recent decades, global initiatives have been launched to control, eliminate or eradicate specific diseases (e.g. polio, measles, HIV, tuberculosis and malaria), and resource-poor countries have benefited greatly from these initiatives to build laboratory capacity related to these specific diseases and also introduce a “public health approach” in laboratories. ^2,8 These disease-specific programmes have helped to highlight the “system bottlenecks” that must also be addressed in order to have high-performing and sustainable laboratory services that meet national public health needs. The participatory approach probably improved the quality of the process and results, as use of the LAT in a participatory way enables countries to take ownership of this process and results, and uses a systems approach to assessing and building laboratory capacity. In Thailand, use of the adapted LAT elucidated strengths and weaknesses of the national PHLs from a “systems” and “core capacity” perspective. The next step is to use these findings strategically to guide the next practical steps in strengthening laboratory capacity and capabilities to improve public health surveillance and disease control.

In summary, this assessment highlighted considerable strengths, but also weaknesses and opportunities to further develop a national laboratory network to help meet the public health priorities of Thailand and ensure compliance with IHR (2005). The participatory strategy, which employed an adaptation of an international tool to the national needs and local context, can serve as a model approach for similar initiatives in other countries and regions. The results of the assessment provide critical information to guide decisions, using a systems approach for the next steps to maximize the efficiency and effectiveness of laboratory services, which are critical to meeting public health needs in Thailand.
REFERENCES


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Conflict of Interest: None declared.

Contributorship: AHP conceived of the study and participated in its design and coordination and drafted the manuscript; MB participated in the study design and participated in the drafting of the manuscript; LT, LC, PC, RG, LS, KS, DW, WW, AN, AP participated in the study design and coordination; AT, LFP participated in the study design and coordination and participated in the drafting of the manuscript; XL participated in the conception of the study, and in its design and coordination and drafting of the manuscript; MAR participated in the drafting of the manuscript. The views expressed in this article are the authors’ own and not an official position of the MOPH-Thailand, US Centers for Disease Control and Prevention, World Health Organization, IQLS or US Department of State Biosecurity Engagement Program.
Health spending, macroeconomics and fiscal space in countries of the World Health Organization South-East Asia Region

Indrani Gupta, Swadhin Mondal

ABSTRACT

The paper examines the issues around mobilization of resources for the 11 countries of the South-East Asia Region of the World Health Organization (WHO), by analysing their macroeconomic situation, health spending, fiscal space and other determinants of health. With the exception of a few, most of these countries have made fair progress on their own Millennium Development Goal (MDG) targets of maternal mortality ratio and mortality rate in children aged under 5 years. However, the achieved targets have been very modest – with the exception of Thailand and Sri Lanka – indicating the continued need for additional efforts to improve these indicators. The paper discusses the need for investment, by looking at evidence on economic growth, the availability of fiscal space, and improvements in “macroeconomic-plus” factors like poverty, female literacy, governance and efficiency of the health sector. The analysis indicates that, overall, the countries of the WHO South-East Asia Region are collectively in a position to make the transition from low public spending to moderate or even high health spending, which is required, in turn, for transition from low coverage–high out-of-pocket spending (OOPS) to high coverage–low OOPS. However, explicit prioritization for health within the overall government budget for low spenders would require political will and champions who can argue the case of the health sector. Additional innovative avenues of raising resources, such as earmarked taxes or a health levy can be considered in countries with good macroeconomic fundamentals. With the exception of Thailand, this is applicable for all the countries of the region. However, countries with adverse macroeconomic-plus factors, as well as inefficient health systems, need to be alert to the possibility of overinvesting – and thereby wasting – resources for modest health gains, making the challenge of increasing health sector spending alongside competing demands for spending on other areas of the social sector difficult.

Key words: health, macroeconomic factor, resource mobilization for health, South-East Asia

INTRODUCTION

The link between public spending on health and health outcomes is no longer under debate and countries are now increasingly concerned with different ways of raising additional spending and spending such finances efficiently. The two main justifications for raising additional resources are to improve directly health outcomes via provision of public health services, and to be able to reduce the financial burden on households via extending health coverage, especially in countries where out-of-pocket spending (OOPS) as a proportion of gross domestic product (GDP) is very high.

The ability of countries to raise resources for social sector spending, including health, is, in turn, closely related to the availability of fiscal space and the macroeconomic situation in the country, as has been discussed and analysed by a number of researchers, after the World Health Organization (WHO) Commission on Macroeconomics and Health published its recommendations. While the 2010 World Health Report: Health systems financing: the path to universal coverage was
a comprehensive account of health-systems financing with a global perspective, country-specific analytical research on public financing of health remains relatively sparse, especially for the WHO South-East Asia Region. Finally, the importance of other factors, such as literacy and poverty, which might impact on health outcomes and the quality or effectiveness of spending, is an area that is even less explored for countries of this Region. For example, one study found that 95% of cross-national variation in mortality can be explained by a country’s income per capita, inequality of income distribution, extent of female education, level of ethnic fragmentation and predominant religion.9 Such results can be interpreted to mean that adverse social determinants actually reduce the effectiveness of spending, raising concerns about wastage of scarce health sector resources.

Finally, fiscal space generally refers to a country’s ability to increase health spending without affecting other expenditures necessary for development and its own long-term solvency; any analysis of fiscal space generally includes an analysis of the macroeconomic situation of a country – mainly economic growth and its prospects – and increases in government revenue; a re-prioritization of health within the government budget; an increase in health-specific resources, grants and foreign aid for the health sector; and improved efficiency of spending.10

This paper starts with a brief overview of the role of public financing for health, based on the global literature and some quantitative analysis. It then goes on to assess the current situation regarding health outcomes, for the countries of the WHO South-East Asia Region, based on the Millennium Development Goals (MDGs), as well as the overall disease patterns for these countries. Next, an analysis of the current level of health spending, the macroeconomic situation and availability of fiscal space is undertaken, to aid understanding of the ability of these countries to allocate greater resources to the health sector. Finally, the paper discusses some of the other factors that might prevent effective spending and improved health outcomes in the region.

**Centrality of public health spending**

Globally, there have been many analyses of the determinants of health outcomes, such as infant mortality rate (IMR), mortality rate in children aged under 5 years (U5MR) and maternal mortality ratio (MMR).11–16 The role of health expenditure has been central to such analyses, as have variables such as the level and growth of income, poverty, inequality and female literacy rate, as well as health service variables such as immunization and utilization of antenatal care.1,9,17–28 Recent evidence also indicates that higher spending via universal health coverage (UHC) impacts health outcomes positively, with larger benefits for poorer countries.29

However, many of these studies and others argue that merely raising public spending is unlikely to achieve the desired levels of health outcomes.7,30–34 Other key variables that impact on health outcomes are poverty and income; female participation in the labour force; per capita gross national product; primary school enrolment; diphtheria, pertussis, tetanus (DPT) vaccination; female literacy; and income equality rates. Even UHC is unlikely to achieve health goals in the face of adverse values of these variables, especially among vulnerable sections of the population.35

For example, an analysis of the relationship between health, poverty and economic growth in India showed that per capita public health expenditure positively influences health status, that poverty declines with better health and that growth and health have a positive two-way relationship.36 The study also found that public spending on health care matters more to the poor than the non-poor, and that merely increasing public spending will not be sufficient to improve health status significantly. This is also corroborated with studies by King and Bidani, and Ravallion.38 Houweling et al. also demonstrated that higher national incomes were associated with lower mortality rates among children aged under 5 years, though this association was significantly weaker for the poor than for the rich. However, the association between public spending on health and mortality in children aged under 5 years was stronger for the poor.

The link between public spending on health and health outcomes comes via the health system, with a strongly funded well-functioning health system being a key to better health outcomes. However, the preceding literature review indicates that adequate health spending is a necessary but not a sufficient condition for improving outcomes if the other social determinants of health are not addressed. While short-term gains might be in evidence, uneven development of these factors may create barriers to achieving sustainable health outcomes, despite a higher level of spending. Figure 1 plots per capita public spending on health against IMR for 182 countries for 2011, and indicates that while there is a negative relationship between the two, there are countries that are able to achieve the same health outcomes with lower spending, indicating different levels spending efficiency. This could be due to different efficiency levels of health services, as well as the presence of other adverse correlates of health outcomes (social determinants), such as poverty and lack of education.

Despite the different levels of spending efficiency, any proposed move towards UHC would require a higher level of spending, especially for low- and middle-income countries. Improving efficiency of spending would remain a critical strategy in financing for UHC, but may take a longer time horizon to implement and show results. In the meantime, funding would remain an important concern. Irrespective of whether countries opt for tax-funded UHC or scheme-based UHC, funds would be required for the UHC, which would presumably have a large component of subsidy for the poor and vulnerable; for health-system strengthening; for monitoring and evaluation; and for administration and management. All the countries of the South-East Asia Region have been part of this global trend towards UHC, and while countries like Thailand have actually transited to a well-functioning system of UHC, other countries such as Nepal and India are debating the best approach.

The ability of these countries to raise sufficient resources would depend to a great extent on robust and sustainable economic health of the countries, and the availability of fiscal...
space. Needless to say, mere availability of fiscal space may not always lead to the use of that space, unless health is prioritized in public spending, particularly as an important component of social sector spending. A very recent analysis indicates that factors such as democratization, lower levels of corruption, ethnolinguistic homogeneity, and more women in public office are correlated with higher shares of public spending on health. Case studies from this analysis indicate that country-specific political economy considerations are key, and instead of focusing only on government budgetary targets, countries need to focus on the breadth and depth of health coverage. The centrality of public health spending can also be gleaned from its association with OOPS, which is an indicator of the extent of financial protection households have from catastrophic health spending. There are only a few variables that would impact on how much people spend out-of-pocket on health as a proportion of their country’s GDP. While it is expected that a rise in national income might see a rise in this ratio because of the pure income effect, this should taper off with increasing coverage. The increasing health coverage would, in turn, be driven by increases in public spending, which should exert a downward pressure on OOPS. Finally, a well-functioning public health infrastructure would also help reduce OOPS by making people choose public – rather than private – health facilities. A recent cross-country estimate used a simple regression to test whether income, public health spending and a well-functioning infrastructure have any impact on OOPS. The results confirmed that public health spending has a significant impact on a country’s average OOPS: the higher the spending by the government, the lower will be the OOPS. Thus, while health outcomes might be impacted by other social determinants as well, OOPS has a direct link with public health spending, which acts via greater investment in public health infrastructure as well as UHC.

Millennium Development Goals and disease burden in countries of the WHO South-East Asia Region

How have the countries fared in their health outcomes? Table 1 examines the progress in the indicators for MDG 4 (“reduce child mortality”) and MDG 5 (“improve maternal health”), but it also includes IMR, which is often used as an additional

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Figure 1: Infant mortality rate and public health spending per capita

Sources: Authors’ calculation from World Bank World Development Indicators for 2011. Per capita public health expenditure = Public health expenditure total / Total population

Public health expenditure as % of GDP (X)=\(\frac{\text{Public health expenditure total}}{\text{GDP (Y)}}\) x100

Therefore, Public health expenditure total= (X*Y)/100.
Table 1: Millennium Development Goal (MDG) progress for infant mortality rate (IMR), maternal mortality ratio (MMR) and mortality rate in children aged under 5 years (U5MR) in the World Health Organization South-East Asia Region

<table>
<thead>
<tr>
<th></th>
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<th></th>
<th></th>
<th></th>
<th></th>
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</tr>
</thead>
<tbody>
<tr>
<td>Bangladesh</td>
<td>37</td>
<td>33</td>
<td>4</td>
<td>200</td>
<td>138</td>
<td>62</td>
<td>46</td>
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<tr>
<td>Bhutan</td>
<td>33</td>
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<td>140</td>
<td>225</td>
<td>-85</td>
<td>40</td>
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<td>-5</td>
</tr>
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<td>45</td>
<td>29</td>
<td>16</td>
<td>220</td>
<td>140</td>
<td>80</td>
<td>58</td>
<td>42</td>
<td>16</td>
</tr>
<tr>
<td>Indonesia</td>
<td>26</td>
<td>21</td>
<td>5</td>
<td>210</td>
<td>108</td>
<td>102</td>
<td>32</td>
<td>28</td>
<td>4</td>
</tr>
<tr>
<td>DPR Korea</td>
<td>24</td>
<td>11</td>
<td>13</td>
<td>98</td>
<td>21</td>
<td>77</td>
<td>30</td>
<td>14</td>
<td>16</td>
</tr>
<tr>
<td>Maldives</td>
<td>10</td>
<td>23</td>
<td>-13</td>
<td>38</td>
<td>108</td>
<td>-70</td>
<td>12</td>
<td>31</td>
<td>-19</td>
</tr>
<tr>
<td>Myanmar</td>
<td>42</td>
<td>26</td>
<td>16</td>
<td>220</td>
<td>145</td>
<td>75</td>
<td>54</td>
<td>36</td>
<td>18</td>
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<tr>
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<td>33</td>
<td>2</td>
<td>220</td>
<td>198</td>
<td>22</td>
<td>43</td>
<td>47</td>
<td>-4</td>
</tr>
<tr>
<td>Sri Lanka</td>
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<td>3</td>
<td>32</td>
<td>12</td>
<td>20</td>
<td>10</td>
<td>7</td>
<td>3</td>
</tr>
<tr>
<td>Thailand</td>
<td>12</td>
<td>10</td>
<td>2</td>
<td>28</td>
<td>11</td>
<td>17</td>
<td>14</td>
<td>12</td>
<td>2</td>
</tr>
<tr>
<td>Timor-Leste</td>
<td>50</td>
<td>43</td>
<td>7</td>
<td>330</td>
<td>300</td>
<td>30</td>
<td>59</td>
<td>57</td>
<td>2</td>
</tr>
</tbody>
</table>

Notes: the MDG indicator target for IMR, MMR and U5MR was calculated from the World Bank 1990s figure for each indicator. Targets for 2015 are: IMR – reduced by two-thirds between 1990 and 2015; MMR – reduced by three-quarters between 1990 and 2015; U5MR – reduced by two-thirds between 1990 and 2015.


Table 2 presents further evidence compiled from the Global Burden of Diseases, Injuries and Risk Factors Study 2010 country profiles on the highest-ranking causes of premature deaths in terms of number of life-years lost, the biggest change in causes, and the leading risk factor for deaths in each of these countries. This gives a more nuanced picture of the epidemiological challenges the countries are facing, the areas where they have made significant progress, and where they might see the most change. While NCDs are increasing across the board, Bangladesh, Bhutan, India, Myanmar, Nepal and Timor-Leste are still dealing with avoidable diseases relating to pregnancy, birth and infectious diseases. However, they have also been able to address infectious and communicable diseases effectively, as can be seen from the second column of Table 2, raising the hope for further spending effectiveness. In terms of risk factors, for Bangladesh and the Democratic People’s Republic of Korea, smoking is the leading risk factor, while for Nepal it is air pollution from solid fuels. For all the other countries of the Region, dietary risks are the leading risk factor, indicating the possibility of rapid change in their disease profile in the years to come.

The evidence presented indicates that the countries of the South-East Asia Region are facing the dual burden of communicable and noncommunicable diseases, and countries that are yet to effectively arrest infectious, vaccine-preventable diseases will also have to contend with an increasing burden of NCDs. Countries that have yet to meet their MDG targets will clearly have the greatest challenge in terms of resource needs and prioritization. The issue of sufficiency of resources is closely related to the disease profile of countries, and each...
Figure 2: Burden of communicable and noncommunicable diseases in the World Health Organization South-East Asia Region

DPR Korea: Democratic People’s Republic of Korea. Percentages indicate the relative burden of disability-adjusted life years for communicable and noncommunicable diseases (injuries excluded).

Source: Authors’ calculation from WHO, Measurement and Health Information, February 2009.41

Table 2: Leading causes of premature death, change in causes and leading risk factor

<table>
<thead>
<tr>
<th>Country</th>
<th>Highest ranking causes of premature death in terms of number of years of life lost, 2010</th>
<th>Largest decrease among the 25 most important causes of burden of disease (DALYs) from 1990 to 2010</th>
<th>Leading risk factor</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bangladesh</td>
<td>Preterm birth complications, lower respiratory tract infections, neonatal encephalopathy (birth asphyxia and birth trauma)</td>
<td>Diarrhoeal disease, by 85%.</td>
<td>Tobacco smoking</td>
</tr>
<tr>
<td>Bhutan</td>
<td>Lower respiratory tract infections, preterm birth complications, poisonings</td>
<td>Diarrhoeal disease, by 85%</td>
<td>Dietary risks</td>
</tr>
<tr>
<td>Democratic People’s Republic of Korea</td>
<td>Cerebrovascular disease, ischaemic heart disease, chronic obstructive pulmonary disease</td>
<td>Congenital anomalies, by 41%</td>
<td>Tobacco smoking</td>
</tr>
<tr>
<td>India</td>
<td>Preterm birth complications, lower respiratory tract infections, diarrhoea</td>
<td>Measles, by 63%</td>
<td>Dietary risks</td>
</tr>
<tr>
<td>Indonesia</td>
<td>Cerebrovascular disease, tuberculosis, road injury</td>
<td>Lower respiratory tract infections, by 81%</td>
<td>Dietary risks</td>
</tr>
<tr>
<td>Maldives</td>
<td>Ischaemic heart disease, cerebrovascular disease, neonatal encephalopathy (birth asphyxia and birth trauma)</td>
<td>Lower respiratory tract infections, by 89%</td>
<td>Dietary risks</td>
</tr>
<tr>
<td>Myanmar</td>
<td>Lower respiratory tract infections, cerebrovascular disease, HIV/AIDS</td>
<td>Diarrhoeal disease, by 73%</td>
<td>Dietary risks</td>
</tr>
<tr>
<td>Nepal</td>
<td>Lower respiratory tract infections, cerebrovascular disease, neonatal encephalopathy (birth asphyxia and birth trauma)</td>
<td>Congenital anomalies, by 66%</td>
<td>Air pollution from solid fuels</td>
</tr>
<tr>
<td>Sri Lanka</td>
<td>Ischaemic heart disease, self harm, cerebrovascular disease</td>
<td>Interpersonal violence, by 68%</td>
<td>Dietary risks</td>
</tr>
<tr>
<td>Thailand</td>
<td>HIV/AIDS, ischaemic heart disease, road injury</td>
<td>Preterm birth complications, by 56%</td>
<td>Dietary risks</td>
</tr>
<tr>
<td>Timor-Leste</td>
<td>Lower respiratory tract infections, diarrhoea, preterm birth complications</td>
<td>Measles, by 85%</td>
<td>Childhood underweight</td>
</tr>
</tbody>
</table>

DALY: disability-adjusted life year

Source: Compiled from Global Burden of Diseases, Injuries and Risk Factors Study 2010, Country Profiles database.41
country will need to do its own calculations of how many resources are needed under UHC to effectively address their patterns of disease.

**Macroeconomic scenario and fiscal space**

The main concern in the context of UHC is whether countries can spend more on health than current levels. Examination of the macroeconomic and fiscal space indicators in Table 3 for 2005 and 2011 and also Figs 4 and 5 enables an assessment of the countries in the WHO South-East Asia Region that would be able to do that.

In Table 3, the last two columns report public health spending as a percentage of GDP for 2005 and 2011. While the share of public health spending in GDP is often used as a summary indicator of prioritization, this gives only a partial – and sometimes incorrect – picture of priorities. A better indicator is the share of health expenditure in total government expenditure, which is presented in Fig. 3. Looking at this share first, it can be seen that, in 2011, it was highest in Thailand (14.5%) and lowest in Myanmar (1.3%). In 2005, Timor-Leste had the highest share of health expenditure in terms in total government expenditure (38%) but had a very sharp decline to 2.9% in 2011. However, for almost all the countries of the region, this share dropped between 2005 and 2011. For Thailand, there was an increase from 2005 to 2011 and India too was able to increase the share somewhat after 2010. As a share in GDP, public health spending has noticeably increased only in Thailand. For others, it either remained the same or showed a marginal increase, and fell for Maldives, Sri Lanka and Timor-Leste (see Table 3). Together, these two indicators seem to suggest that many of the countries of the region are struggling to accord health a reasonable priority in total government spending.

Bhutan needs to reprioritize its health spending, to prevent a decline in the gains it has been able to make in its health outcomes. Timor-Leste clearly needs to seriously tackle its decline in health spending – especially since its other determinants are rather poor. Sri Lanka has done well but with modest resources, confirming that effectiveness of spending is an important source for health gains.

While high economic growth helps open up additional fiscal space, growth that is too rapid can lead to overheating, leading to inflation, which can effectively erode a country’s capacity to maintain high growth and development. A high level of debt also narrows fiscal space. Domestic resources comprise the most stable source of funding, especially for the social sector, which needs continuous and stable funding. Countries that depend on outside funding like Official Development Assistance (ODA) are less able to sustain their social sector spending than others. Finally, the willingness of countries to set aside an increasing proportion of resources for the social sector is an indication of prioritization within countries.

The first thing to note is that growth has been rather good in all the countries of the Region and higher in 2011 than 2005, with the exception of India and Thailand. This is good, since high growth is a key to expansion of the fiscal space. India’s growth was robust until recently but currently it is seeing a plunge in its growth rate, which some argue may pick up only slowly. India has been also dealing with inflationary pressures for a while now.

For Bangladesh, growth has been more or less stable, though inflation has been quite high. Bhutan has seen substantial

### Table 3: Macroeconomic situation in the World Health Organization South-East Asia Region

<table>
<thead>
<tr>
<th>Country</th>
<th>GDP growth (% of GDP)</th>
<th>Inflation (%)</th>
<th>Tax revenue (% of GDP)</th>
<th>Debt (% of GDP)</th>
<th>Net ODA (% of GNI)</th>
<th>SSS (% of government expenditure)</th>
<th>Public spending on health (% of GDP)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bangladesh</td>
<td>5.96 6.71</td>
<td>7.05 10.71</td>
<td>8.22 9.98</td>
<td>33.9 21.6</td>
<td>2.08 1.23</td>
<td>6.40 4.40</td>
<td>1.10 1.40</td>
</tr>
<tr>
<td>India</td>
<td>9.28 6.33</td>
<td>4.25 8.86</td>
<td>9.91 10.39</td>
<td>61.19 48.5</td>
<td>0.23 0.17</td>
<td>6.85 8.05</td>
<td>0.90 1.20</td>
</tr>
<tr>
<td>Indonesia</td>
<td>5.69 6.49</td>
<td>10.45 5.36</td>
<td>12.5 11.77</td>
<td>47.34 26.24</td>
<td>0.93 0.05</td>
<td>19.84 20.5</td>
<td>0.90 0.90</td>
</tr>
<tr>
<td>Maldives</td>
<td>-8.68 7.05</td>
<td>2.30 14.85</td>
<td>13.56 17.0</td>
<td>39.77 68.4</td>
<td>8.02 2.51</td>
<td>24.36 25.85</td>
<td>4.20 3.80</td>
</tr>
<tr>
<td>Myanmar</td>
<td>13.64 5.60</td>
<td>9.37 5.02</td>
<td>4.30 3.70</td>
<td>NA 16</td>
<td>NA NA</td>
<td>0.63 NA</td>
<td>0.20 0.30</td>
</tr>
<tr>
<td>Nepal</td>
<td>3.48 3.88</td>
<td>6.84 9.55</td>
<td>9.18 13.25</td>
<td>51.76 34.1</td>
<td>5.2 4.68</td>
<td>5.25 11.00</td>
<td>2.00 2.10</td>
</tr>
<tr>
<td>Sri Lanka</td>
<td>6.24 8.25</td>
<td>11.64 6.72</td>
<td>13.73 12.42</td>
<td>90.6 81.9</td>
<td>4.82 1.04</td>
<td>38.49 27.05</td>
<td>1.90 1.50</td>
</tr>
<tr>
<td>Thailand</td>
<td>4.60 0.08</td>
<td>4.54 3.81</td>
<td>17.24 17.55</td>
<td>27.33 30.18</td>
<td>-0.1 -0.05</td>
<td>36.35 43.95</td>
<td>2.30 3.10</td>
</tr>
<tr>
<td>Timor-Leste</td>
<td>6.22 10.81</td>
<td>1.11 13.5</td>
<td>1.50 1.10</td>
<td>0.00 0.00</td>
<td>21.84 6.73</td>
<td>38.29 11.06</td>
<td>8.80 3.60</td>
</tr>
</tbody>
</table>

GDP: gross domestic product; GNI: gross national income; NA: not available; ODA: Official Development Assistance; SSS: social sector spending (health and education)

Figure 3: Public health expenditure as % of total government expenditure, 2005–2011
Source: World Bank World Development Indicators.39

Figure 4: Relative position of nine countries of the WHO South-East Asia Region, in terms of ratios of fiscal deficit to gross domestic product (GDP) and public debt to GDP
Source: World Bank World Development Indicators for 2012.39
growth in the recent past, driven by the hydropower sector developments. The International Monetary Fund (IMF) predicts a favourable medium-term outlook, with growth remaining between 8% and 9%.\(^{48}\) Inflation has risen, however, and Bhutan may need to watch out for possible overheating. There is some indication that inflation has recently been brought under control.\(^{49}\) Maldives has recently seen a slowdown in growth, owing to global conditions and slowdown in tourism, on which it depends heavily. Given its recent-found stability, Myanmar — a resource-rich country — had done rather well. Policy reforms have stimulated economic growth in the recent past and are expected to drive further development in the near future,\(^{50}\) and inflation has been moderate.

Nepal's political situation hampers a faster macroeconomic turnaround, despite the fact that recent economic performance has picked up somewhat. The country depends heavily on the monsoon, service sector growth and foreign remittances, making predictions somewhat difficult. Inflation was high, but is currently moderate. Sri Lanka continues to experience strong economic growth, despite a long history of internal conflict. The government has been stimulating economic growth by pursuing large-scale reconstruction and development projects supplemented with private investment, especially in war-torn and disadvantaged areas.

Although the Thai economy has been severely affected by the global financial crisis over the past few years, supply-chain disruptions following the tsunami in Japan, and the devastating 2011 floods, the economy has rebounded recently, with modest GDP growth (GDP rose by 6.4% in 2012 compared with just 0.1% in the previous year) and a modest inflation rate. After a long history of internal conflict (1999–2006), Timor-Leste has made significant economic progress towards stable economic growth. The country has initiated a new development phase that is pursuing a high rate of sustainable economic growth through the conversion of petroleum wealth into human and physical capital. However, inflation has been a worry, owing to too rapid a growth.

An earlier paper analysed constraints in fiscal space for countries of the WHO South-East Asia Region.\(^{51}\) The current paper uses revised estimates in Figs 4 and 5 to demonstrate four key dimensions of fiscal space for these countries: fiscal-deficit-to-GDP ratio, government debt as a proportion of GDP, tax revenues, and ODA.

Figure 4 shows the ratios of fiscal deficit to GDP and government debt to GDP in nine countries of the region. The two benchmarks shown are those laid down in the Treaty on European Union (Maastricht Treaty),\(^{52}\) as indicators of sound fiscal policies, namely: a fiscal-deficit-to-GDP ratio of no more than 3% and government debt no greater than 60% of GDP.\(^{53}\) While these benchmarks have been discussed and often critiqued,\(^{54}\) they remain widely used.\(^{55}\) The lower the values of these parameters, the better is the fiscal position of the country. The best position to be in is in the top left quadrant and only Indonesia and Thailand are here. Bangladesh and Myanmar are also doing well. Bhutan’s fiscal situation is favourable but it faces a high public debt ratio. India, Sri Lanka and Maldives are not performing very well on these two parameters.

![Figure 5: Relative position of 10 countries of the World Health Organization South-East Asia Region, in terms of Official Development Assistance (ODA) to gross domestic product (GDP) and revenue to GDP. Source: World Bank World Development Indicators for 2012.\(^{39}\)](image-url)
In Figure 5, the inverse values of revenue-to-GDP and aid-to-GDP ratios are plotted, with the threshold values indicated with solid lines: revenue-to-GDP 13% or more, and aid-to-GDP 5% or less. 56–58 The best quadrant to be in is the lower left one. Maldives is in the most favourable situation with respect to both these parameters. Thailand, Indonesia, Nepal and Timor-Leste are also comfortable. Bangladesh, India and Myanmar need to seriously focus on their revenue situations. Overall, most of the countries of the WHO South-East Asia Region have manageable aid-to-GDP ratios, but their revenue-to-GDP ratios are not very favourable.

Bangladesh does not depend too much on ODA and has also been able to increase tax revenue somewhat, though it can probably be raised further. Given these mostly positive scenarios, it does seem possible for Bangladesh to increase its social sector spending substantially, by exploiting the available fiscal space; it is among the lowest spenders on health among countries of the South-East Asia Region.

Bhutan has been able to raise its social sector spending significantly, as well as its tax share in GDP. Currently, it does seem as though Bhutan has less fiscal space relative to the other countries and may need to focus on its effectiveness of spending or some other innovative approach like earmarked taxes on hitherto untaxed areas such as tourism, which will not increase the domestic tax burden further.

While India’s current focus is to stabilize growth and control the sliding rupee, it has had robust growth in the past, but has not been able to raise its social sector spending significantly. It continues to spend very modestly on health specifically, and on the social sector generally. India has had – and if its economy improves will have – enough fiscal space to garner additional funds for health.

Indonesia has seen robust growth and does not have a debt or external dependence issue. Its fiscal deficit, however, has been high, and inflationary pressures continue. Despite its modest tax effort, it has been able to spend substantially on the social sector. However, health spending has been rather low, and it needs to find ways of directing some of its social sector spending towards health. There remains scope to increase taxes as one possible source of funding, given that the country has been experiencing robust growth.

Maldives has had a high fiscal deficit for a while now and experts contend that improving its fiscal situation is a key priority for Maldives. 39 The large deficit is also responsible for the high public debt ratio. Maldives has relatively strong tax revenues overall and has already been able to increase social sector spending substantially. Government spending on health is the highest among the countries of the WHO South-East Asia Region. It may not have a lot more fiscal space at this point, and needs to focus on deprioritization and improved efficiency of health spending. Nevertheless, tourism remains an avenue for additional resources, if necessary.

While some teething problems remain in areas such as government controls, economic policies and governance, 40 recently Myanmar made a major policy reform for stimulating economic growth and it is expected to drive further development. 49 Growth is accelerating, external balances remain stable and fiscal policy has been wisely encouraging fiscal prudence, while at the same time helping boost investment and social spending, and supporting macroeconomic stability. Myanmar has substantial potential to use the existing GDP growth for increasing social sector spending significantly.

For Nepal, the major concern is the high level of poverty and unemployment (46%) in the country.61 Despite this, Nepal has managed to raise its social sector spending by garnering additional revenues from its GDP. It spends more than India and Sri Lanka on health, but can possibly raise additional resources from domestic funds, if necessary.

In Sri Lanka, the government’s high debt payments and historically high budget deficits have been controlled to a certain extent by recent economic reforms in line with IMF recommendations.62 Inflation has also been under control to a certain extent. Sri Lanka has been able to sustain favourable health outcomes despite low health spending as a percentage of GDP. There remains enough fiscal space for it to try and increase health spending to deal with changing disease patterns.

As will be seen in the next section, in Timor-Leste, poverty, illiteracy and unemployment remain causes of concern. Despite this, Timor-Leste has met its MDG targets already, but sustainability and further improvements cannot be guaranteed, owing to its adverse social indicators and the somewhat lopsided growth model that it has pursued. It will have to reduce dependence on external funds and use more of its domestic resources, which it can easily do given the high growth rates.

Macroeconomic-plus factors in the WHO South-East Asia Region

Finally, Table 4 presents selected indicators besides the ones pertaining to health outcomes and fiscal space, to aid understanding of how countries have fared based on these indicators. Selected parameters such as GDP per capita, poverty, female literacy, inequality and extent of immunization are used and these have been called “macroeconomic-plus” factors. A last column has been added for per capita health spending, to contextualize the discussion.

Table 4 shows that, while each country is at a different point with respect to some of these selected macroeconomic-plus factors, countries with high GDP per capita are also countries with low poverty head count ratio and high female literacy. Thus, for example, Indonesia, Maldives, Sri Lanka and Thailand have relatively high GDP per capita, but also low poverty. These are also countries with high female literacy rates.
From earlier discussions, it is known that these countries also have favourable health outcomes. For the other countries, one or the other of these social determinants would slow down the improvements in health outcomes. Thus, for example, Bangladesh, Bhutan, India, Nepal and Timor-Leste need to improve either poverty or literacy rates, or both. Clearly, a confluence of these various determinants coupled with moderate to high health spending would ensure sustainable and improved health outcomes.

Maldives leads for per capita health spending, with Thailand following in the second place, followed by Bhutan, Indonesia and Sri Lanka. For this group of countries, there seems to be a positive association between per capita spending, health outcomes and macroeconomic-plus factors generally.

**CONCLUSION**

Countries of the WHO South-East Asia Region are at different stages in terms of both health outcomes and health spending. However, while countries such as Thailand and Maldives are ahead of the others in terms of health outcomes, their main concerns would be around reprioritizing government budgets to raise additional resources for health, to address their changing disease patterns – especially the burden of NCD. Given their favourable macroeconomic and macroeconomic-plus indicators, such additional investment would help improve their health outcomes significantly.

Bhutan is more or less in a stable situation; given its small size, its current problems are expansion of the supply side, including health personnel, for which it would have to review its internal policies and work on external cooperation. It will probably have to continue to garner some external assistance to prevent a fall in health’s share in total government spending, but health equity is not a glaring issue within the country.

Sri Lanka may have exhausted its possibilities of getting additional benefits from low spending, and needs to spend substantially more on health, which it can do with its current levels of growth and fiscal space situation.

The remaining countries are spending much less on health per capita; given their fairly positive growth and macroeconomic scenario, raising resources should not be a problem in countries such as Bangladesh, India, Indonesia and Nepal that currently have a low revenue-to-GDP ratio. Indonesia is progressing well in its plan for UHC and it seems entirely possible for it to give health a higher priority. India has been discussing UHC internally and needs to show commitment to the health sector by increasing spending significantly, which it can do despite its current growth problems. For India, the question is of prioritizing health. India is lagging behind in its MDGs in any case, but adverse socioeconomic indicators would further affect the efficiency of spending, and increase the need for even higher resources. Also, Bangladesh and Nepal need to take care to sustain their health gains, unless their macroeconomic-plus factors improve.

Myanmar’s economic history is relatively new, but it has shown remarkable results in a short time in terms of economic policy. While it might take longer for it to reach an equilibrium level of health spending, its growth and macroeconomic situation indicate that fiscal space will expand further. However, it has to seriously tackle its socioeconomic indicators, to prevent erosion of efficiency in spending.

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Table 4: Macroeconomic-plus indicators in 10 countries of the World Health Organization South-East Asia Region (selected variables)

<table>
<thead>
<tr>
<th>Country</th>
<th>GDP per capita (current US$)</th>
<th>Poverty headcount ratio at US$ 1.25 a day (PPP) (% of population)</th>
<th>GINI index</th>
<th>Literacy rate, adult female (% of females aged 15 and above)</th>
<th>Immunization, DPT (% of children aged 12–23 months)</th>
<th>Public health expenditure per capita (current US$)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bangladesh</td>
<td>664.1</td>
<td>43.3</td>
<td>32.1</td>
<td>52.2</td>
<td>95</td>
<td>9.0</td>
</tr>
<tr>
<td>Bhutan</td>
<td>2211.2</td>
<td>10.2</td>
<td>38.1</td>
<td>38.7</td>
<td>91</td>
<td>79.8</td>
</tr>
<tr>
<td>India</td>
<td>1419.1</td>
<td>32.7</td>
<td>33.9</td>
<td>50.8</td>
<td>72</td>
<td>15.0</td>
</tr>
<tr>
<td>Indonesia</td>
<td>2946.7</td>
<td>18.1</td>
<td>35.6</td>
<td>89.1</td>
<td>63</td>
<td>30.3</td>
</tr>
<tr>
<td>Maldives</td>
<td>6552.5</td>
<td>16.0</td>
<td>37.4</td>
<td>98.4</td>
<td>96</td>
<td>248.1</td>
</tr>
<tr>
<td>Myanmar</td>
<td>1400.0</td>
<td>32.7</td>
<td>NA</td>
<td>89.9</td>
<td>99</td>
<td>NA</td>
</tr>
<tr>
<td>Nepal</td>
<td>594.3</td>
<td>24.8</td>
<td>32.8</td>
<td>48.3</td>
<td>82</td>
<td>11.3</td>
</tr>
<tr>
<td>Sri Lanka</td>
<td>2399.9</td>
<td>4.1</td>
<td>36.4</td>
<td>90.0</td>
<td>99</td>
<td>37.8</td>
</tr>
<tr>
<td>Thailand</td>
<td>4802.7</td>
<td>0.4</td>
<td>39.4</td>
<td>91.5</td>
<td>99</td>
<td>139.9</td>
</tr>
<tr>
<td>Timor-Leste</td>
<td>766.0</td>
<td>41.0</td>
<td>31.9</td>
<td>53.0</td>
<td>72</td>
<td>32.9</td>
</tr>
</tbody>
</table>

DPT: diphtheria, polio, tetanus; GDP: gross domestic product; NA: not available; PPP: purchasing power parity

Source: World Bank World Development Indicators for 2010; sources of GINI indices are Index Mundi Country Economic Profiles 2013 (www.indexmundi.com). For each country, the coefficient is for the most recent year for which data are available.
Gupta and Mondal: Health spending, macroeconomics and fiscal space in SEAR

Tolim-Leste would have to re prioritize health and social sector spending by using a much greater slice of its oil revenue right away, to tackle health and other social determinants of health.

Overall, countries of the WHO South-East Asia Region are collectively in a position to make the transition from low average spending to moderate or even high health spending, which will be required, in turn, for transition from low coverage–high OOPS to high coverage–low OOPS. However, explicit prioritization for health within the overall government budget for low spenders would require political will and champions who can argue the case of the health sector. Additional innovative avenues of raising resources such as earmarked taxes or a health levy can be considered in countries with good macroeconomic fundamentals. With the exception of Thailand, this is applicable for all the countries of the Region. However, countries with adverse macroeconomic-plus factors, including an inefficient health system, need to be alert to the possibility of overinvesting – and thereby wasting – resources for modest health gains, making the challenge of increasing health sector spending alongside competing demands for spending on other areas of the social sector a difficult one.

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Evidence-informed policy formulation: the case of the voucher scheme for maternal and child health in Myanmar

Yot Teerawattananon,¹ Sripen Tantivess,¹ Pitsaphun Werayingyong,¹ Pritaporn Kingkaew,¹ Nilar Tin,² San San Aye,³ Phone Myint³

ABSTRACT

Introduction: In 2010, with financial support from the Global Alliance for Vaccine and Immunization’s Health System Strengthening programme, the Government of Myanmar established a scheme to improve coverage of maternal and child health (MCH) services. Employing qualitative approaches, this article reviews the processes through which this scheme was devised, focusing on evidence generation and the use of such evidence to inform policy formulation. To address the problem of high mortality rates among mothers and infants, collaborative research was conducted by Myanmar’s Ministry of Health, the World Health Organization, and a research arm of Thailand’s Ministry of Public Health, between March 2010 and September 2011. In the early phase of this study, key barriers to government-provided MCH services were identified. Based on a comprehensive review of the literature, the introduction of a voucher scheme was raised for consideration by ministry of health decision-makers and respective stakeholders. Despite the successful experience of this financing strategy in low-income countries, a series of surveys, an economic evaluation, and focus group discussions were carried out to assess the feasibility and potential health and economic implications of this scheme in the Myanmar context. The research findings were then used to guide the design and adoption of the newly established initiative.

Key words: health financing, maternal and child health, Myanmar, voucher scheme

INTRODUCTION

Located in South-East Asia with a population of 57.5 million, Myanmar is a low-income country that was rated 149th out of 187 countries on the 2011 United Nations Development Programme (UNDP) Human Development Index.¹ The country spent approximately 454 000 million kyats a year on health in 2007 (475 kyats = 1 international dollar in 2010),¹² with 80% of this amount shouldered by households.³ As a consequence of the underutilization of essential health services, including those for mothers and children, maternal and infant mortality rates were high, at 1.5 (maternal, national) and 30.0 (infant, rural), respectively, per 1000 live births in 2008.⁴

In 2008, to fill the existing gap, and with assistance from the World Health Organization (WHO) and the United Nations Children’s Fund (UNICEF), the Government of Myanmar developed a proposal to apply for the Health System Strengthening (HSS) grant organized by the Global Alliance for Vaccine and Immunization (GAVI).⁵ Approved in July of the same year, a reform initiative was established, with the aim to improve coverage of essential primary health care, including maternal and child health (MCH) services, through the strengthening of programme coordination, health system planning, and human resources management.⁶ WHO played a crucial role in facilitating resource mobilization, including technical support from various sources.⁷ In addition to WHO experts, researchers from a research unit under the Ministry of Public Health, Thailand – the Health Intervention and Technology Assessment Program (HITAP) – were invited to provide technical support on health financing, which is one of the three components of the GAVI HSS programme. The other two components include human resource and infrastructure development for MCH services.

By employing qualitative techniques such as document reviews, personal communication and participatory observations, this paper aims to share Myanmar’s experience on the development of a voucher scheme to reduce financial barriers to government-provided MCH services. Its emphasis is on evidence generation...
through a joint research project conducted by Myanmar’s Ministry of Health, WHO and HITAP, and also on the use of research findings to guide policy adoption and scheme design between March 2010 and September 2011. Further details of this research collaboration, research methods, results and related materials are published elsewhere.8

APPROACH OF THE COLLABORATIVE PROJECT

This study begins with a situation analysis, including the identification of key barriers to MCH services and potential solutions. Experiences in low-income countries, especially Bangladesh,9 Cambodia,10 and Nepal,11 were reviewed, in order to explore the effectiveness and drawbacks of different financing modalities to improve the health of pregnant women and infants. A protocol for the MCH voucher scheme in Myanmar was then developed and assessed, based on technical and managerial feasibility, contextual relevance and stakeholder acceptability. In this regard, the research team conducted eight sessions of focus group discussions with 44 stakeholders from two selected townships, Le We and Tatkone. The participants were ministry of health officers, members of the township health committee, township medical officers, midwives and pregnant women. Personal communication was employed to verify the information obtained on some elements.

In addition, a costing study was carried out in 17 health facilities at different levels, to assess perinatal care and delivery costs. A community survey was also conducted by trained ministry of health staff in 25 villages, randomly selected, in the two townships, between September and November 2010, to determine the experiences and household expenses for pregnancy care and child delivery; 215 pregnant women during the study period and 97 new mothers (delivered no more than 30 days before the data collection) who gave consent were interviewed. The results of the costing study and survey were subsequently used as input parameters in an economic model to estimate the potential costs, health outcomes and budget impact of the MCH voucher scheme compared with the current situation. These research findings were ultimately presented to ministry of health decision-makers, representatives of key international donors in Myanmar, and health professionals at the township level, for verification purposes.

CURRENT STATUS OF MATERNAL AND CHILD HEALTH SERVICES UTILIZATION AND KEY BARRIERS

In Myanmar, over 900 000 women become pregnant annually. Out of this total, only 68% and 50% receive antenatal care and delivery services, respectively, provided by skilled birth attendants.12 Meanwhile, non-skilled birth attendants, including auxiliary midwives and traditional birth attendants, play an important part in the provision of MCH care. Information obtained from the focus group discussions indicated that poor people in rural areas sought delivery care from traditional birth attendants, who also provided other services such as washing, cleaning and taking care of children and the neonates during the first week after delivery. Concerns have been raised that a significant fraction of neonatal deaths are associated with obtaining care from these providers.13 On the other hand, other research indicates that well-trained and supported traditional birth attendants could have a role in the reduction of perinatal mortality in many settings.14

Home deliveries are common, especially in remote, hard-to-reach areas, because travelling to health facilities is time-consuming, as well as a substantial financial burden. Although MCH services are freely provided by the government, the midwives and medical officers interviewed maintained that there were severe shortages of medical and surgical supplies, and that clients had to pay out-of-pocket to obtain these supplies from private pharmacies. In addition, public MCH care providers were paid voluntarily by their clients as the latter wanted to express their gratitude for the services received. The providers accepted these payments to compensate both for their underpaid salary and the cost of travelling between the health facilities and villages; neither were subsidized by the government.

The community survey indicated that household spending on MCH services was significant, at approximately 28 000 kyats and 32 000 kyats for deliveries assisted by non-skilled birth attendants and by skilled birth attendants, respectively. The majority (67%) of pregnant women and new mothers faced difficulties in raising funds to address these costs. Thirty-nine per cent of them borrowed money from others, 17% did without essential food consumption, and 13% sold or pledged crops or gold in order to pay for the MCH services.

THE MATERNAL AND CHILD HEALTH VOUCHER SCHEME: FEASIBILITY AND FEATURES

Following a comprehensive literature review and a discussion among ministry of health officers and respective stakeholders, it was agreed that a voucher scheme was feasible and could be effective in enhancing the uptake of government-provided MCH services, since this intervention would eliminate existing financial barriers on the demand side. Furthermore, it was decided that this scheme would cover the costs of service provision previously shouldered by township hospitals and health stations. The first model of this initiative was developed by the research team and submitted to ministry of health decision-makers. The experience of other countries has been that demand-side financing for MCH care works well when all of pregnant women and mothers are entitled to the scheme’s benefits. For Myanmar, however, it was decided that only pregnant women and mothers with low incomes would be targeted, owing to concerns about affordability and financial sustainability.

Regarding the voucher distribution, the focus group discussion participants argued that it should not be monopolized by particular groups or organizations, but should rather involve contextually relevant stakeholders, such as members of village health committees and community support groups, traditional healers, police personnel and monks. As also agreed by ministry of health officers and key stakeholders, the benefits covered in this scheme would include four antenatal care visits, delivery and postnatal care, as well as MCH services-related transportation, food and lodging. The voucher holders would receive free services from midwives and physicians and would be able to choose whether to deliver at home or at health centres.
In the case of delivery at health centres, the financial burden for transportation, food and lodging would be subsidized by cash handouts. The reimbursement for the service costs would be claimed by forwarding the vouchers collected by the health providers to the ministry of health.

**DETERMINING THE VALUE OF THE VOUCHER AND COST-EFFECTIVENESS OF THE SCHEME**

Using the societal viewpoint, an economic analysis conducted under this collaborative research indicated that introducing the voucher scheme would increase the coverage of government-provided MCH services from 73% to 93% for antenatal care and 51% to 71% for delivery. At the same time, the total cost of the MCH programme, which includes not only direct medical care costs but also direct non-medical care costs and indirect costs, would increase by 95 000 kyats per woman who obtained antenatal care and delivery services. This means that if the scheme was designed to cover all of the additional costs incurred by both health providers and households, the voucher’s value should be set at 95 000 kyats. It was noted that the value of the voucher could be adjusted if the government decided to partially subsidize the programme’s costs. If the government decided to fund the programme in full, uptake of the MCH voucher scheme would be expected to increase, resulting in better value for money of the scheme.

The economic analysis also suggested that the MCH voucher scheme is a cost-effective policy intervention. If the cost of services provided under this scheme is fully covered, the lives of one mother and four infants would be saved for every 1000 voucher holders who used the services. As a result, the incremental cost–effectiveness ratio – or the additional cost per life-year saved from the introduction of the MCH voucher scheme – compared with the status quo is estimated to be 377 000 kyats. As recommended by WHO Commission on Macroeconomics and Health, the cost-effectiveness threshold for investment in health interventions in developing countries is equal to the gross national income (GNI) per capita. If such a threshold was applied, the MCH voucher scheme would offer value for money, given Myanmar’s GNI per capita of 413 800 kyats in 2010.

**DISCUSSION**

As suggested in the joint research studies, the introduction of the voucher scheme for MCH services in Myanmar is feasible and represents good value for money. From the outset, the voucher scheme was likely to obtain strong support from community leaders and civic groups, and was, predictably, accepted by the target clients and service providers, owing to the resulting reduction of financial impediments in accessing essential care for mothers and infants, particularly in rural areas. At a reasonable rate of cost subsidization, the scheme has good potential to save the lives of mothers and infants who are currently unable to access MCH services provided by skilled birth attendants.

The joint research, as discussed in this paper, is an ex-ante assessment of a public health programme to guide policy adoption and the design of its features. The set of studies employed both qualitative and quantitative techniques, in order to obtain insight on the country context, and also encouraged the participation of multiple stakeholders, in order to ensure contextually relevant policy recommendations. However, the use of their results should not be absolute because some parts of the research deployed particular parameters from different settings and contained some assumptions that may not be applicable in this setting. This means that there are some uncertainties in the results of this study. Therefore, a closely monitored pilot study in a small area was recommended to ensure that the parameters and assumptions are properly revised before scaling up the programme nationwide.

The need to attain greater efficiency from international aid programmes in the health sector, such as those organized by the Global Fund, GAVI and other United Nations agencies, is notably relevant because growth in foreign aid has declined as a result of the economic recession. This joint research on the voucher scheme in Myanmar provides a role model for global health funding agencies and development partners to maximize good health in recipient countries and ensure efficient use of allocated budgets. Measuring the potential impact and value for money of their investments should be a part of the process for international development assistance.

The results illustrated in this paper were presented to senior decision-makers at the ministry of health, as well as to representatives from WHO and UNICEF, in March and August 2011. An agreement was reached to implement the voucher scheme in one township before expanding to other areas of the country. In May 2013, a pilot scheme was introduced in Yedarshey township. A mid-term evaluation conducted in January 2014 suggested that the scheme improved access of poor pregnant women to antenatal care and delivery services provided by skilled birth attendants.

One important point mentioned by stakeholders was the need to prioritize the development of human resources at both the central level (the ministry of health staff, who manage the MCH voucher scheme) and the peripheral level (health professionals, who are service providers). To address this, the HSS grant supported by GAVI will be used to build up the capacity of physicians and midwives, by increasing their numbers within the next couple of years. WHO proposed a training programme for ministry of health staff at the central level, in order to develop a concrete public communication plan for the MCH voucher scheme, as well as to strengthen the monitoring and evaluation systems. Conducted by HITAP and its partners, the training programme for ministry of health officers was completed at the end of 2011.

The need for locally relevant research and the national capacity to foster proper policy formulation, implementation, monitoring and evaluation, while ensuring sustainable outcomes of the health investments, is becoming increasingly crucial. Therefore, this research collaboration provides a good example of a capacity-strengthening programme within the Region. WHO and HITAP not only provided supervision on research activities, but also involved ministry of health officers and other stakeholders at every step of the study. This included encouraging the participation of local personnel in data collection, analysis and interpretation, as well as in establishing policy recommendations from the research results.
In addition, the Thai institute and its research staff also benefited from this project. HITAP’s participation as programme consultant not only widened the organizational experience of managing the research study in a different sociocultural context, but also provided the opportunity to network with Myanmar’s Ministry of Health. To pursue the sustainable development of low- and middle-income countries’ health systems, international agencies and donors need to emphasize that their investments should be used to strengthen local human resources. As suggested in this paper, South–South collaboration is a promising platform for capacity transfer because it provides significant opportunities for sharing lessons and expertise, to deal efficiently with common problems faced by countries in the same region, thereby promoting further regional cooperation.

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Universal access to medicines: evidence from Rajasthan, India

Sakthivel Selvaraj, Indranil Mukhopadhyay, Preeti Kumar, Malini Aisola, Pritam Datta, Pallav Bhat, Aashna Mehta, Swati Srivastava, Chhaya Pachauli

ABSTRACT

India has outlined its commitment to achieving universal health coverage and several states in India are rolling out strategies to support this aim. In 2011, Rajasthan implemented an ambitious universal access to medicines programme based on a centralized procurement and decentralized distribution model. In terms of the three dimensions of universal health coverage, the scheme has made significant positive strides within a short period of implementation. The key objectives of this paper are to assess the likely implications of providing universal access to essential medicines in Rajasthan, which has a population of 70 million. Primary field-level data were obtained from 112 public health-care facilities using multistage random sampling. National Sample Survey Organization data and health system data were also analysed. The per capita health expenditure during the pre-reform period was estimated to be ₹5.7 and is now close to ₹50. Availability of essential medicines was encouraging and utilization of public facilities had increased. With additional per capita annual investment of ₹43, the scheme has brought about several improvements in the delivery of essential services and increased utilization of public facilities in the state and, as a result, enhanced efficiency of the system. Although there was an attempt to convert the scheme into a targeted one with the change in government, strong resistance from the civil society resulted in such efforts being defeated and the universality of the scheme has been retained.

Key words: drug availability, drug stock-outs, essential medicines, financial risk protection, universal health coverage

INTRODUCTION

The role and relevance of medicines, vaccines and other supplies are critical, as these are considered to be important elements of the health-care system. Access to medicines in resource-poor settings has been intrinsically linked to the fulfilment of a broader right to health mandate. It assumes an extremely vital role in low- and middle-income countries (LMICs), as lack of access to essential medicines and vaccines leads to poor financial risk protection, causing substantial poverty. This is often the result of households spending a large share of their out-of-pocket (OOP) expenditure on medicines. Despite being the “pharmacy of the global south”, over 65% of India’s population does not have access to essential medicines. Global evidence and evidence from India point to several barriers to access to medicines. Firstly, health-care financing and provision is largely a private affair in most LMICs. India perhaps leads the way with nearly 70% of all health-care financing derived from households, while 70% of all household expenditure goes to buying medicines from the private market. As a result of persistent public underinvestment, the private medicine market has thrived, leaving households to incur catastrophic payments and making them vulnerable to poverty. Out of 100 million people who are globally impoverished as a result of household OOP expenditure, over 40 million are in India. Since expenditure on medicines accounts for a larger share of household OOP expenditure on health care, a main reason for medical impoverishment is because of household spending on medicines.

Poor financial risk protection of households in India, resulting from gross underinvestment in the health sector, especially on medicines, has led to a scenario where access to essential medicines has become extremely difficult. According to several national household surveys, the availability of free essential medicines in public health-care facilities has been dwindling. It has been reported that during the mid-1980s,
approximately a third of the medicines prescribed during hospitalization in public health-care facilities were supplied for free; however, during 2004, the mean availability declined sharply to approximately 9%. For outpatient care, free medicine supply declined from 18% to about 5% over the same period.12

While the evidence is limited, available data from several Indian states demonstrate significant variations in the availability and stock-outs of essential medicines. For example, a recent survey in Tamil Nadu and Bihar showed that the mean availability of a selected basket of essential medicines for Bihar was about 43% as compared with 88% for Tamil Nadu,13 while a study by Cameron et al.9 noted that the median availability of critical medicines in the public health system was about 30% in Chennai, 10% in Haryana, 12.5% in Karnataka, 3.3% in Maharashtra (12 districts) and 0% in West Bengal. A recent survey of health-care facilities operated by either the State Government or the Municipal Corporation of Delhi showed that the mean availability of essential medicines was 41.3% and 23.2%, respectively; in tertiary health-care facilities operated under the federal government, the availability was about 50%.14

Several factors can influence the provision and use of essential medicines via the public health-care system. These factors include: poor and incomplete stocking of essential medicines because of inadequate budgetary support; poor supply chain management, leading to frequent stock-outs; prevailing prescription practices leading to inessential and costlier prescriptions for medicines from outside the public health-care system; and a lack of confidence in the quality of medicines supplied through the public health-care system. In addition, while availability may not be a significant barrier in the private sector, affordability often becomes a critical issue.

Health-care systems in several LMICs are in disarray because of persistent underinvestment. Lack of a strong tax-based financed health-care system or a social health insurance system precludes households from prepayment and risk-pooling strategies. It is argued that by extending health insurance coverage to outpatient care, access to medicines could be substantially improved, thereby leading to a reduction in OOP payments.15 Others suggest that increased access – both physical and financial – can be enhanced by scaling up public spending to strengthen the government health system; this is expected to bring down household OOP expenditure, and improve prescription patterns in specific and overall rationality of care.12

While sustainable financing for drug procurement is essential, the allotted funds may not reach the intended beneficiaries without a concomitant reliable and efficient supply chain management system extending from manufacturer to patient. Even if the funds reach front-line service facilities, the drugs required for dispensing may not be delivered in a timely and uninterrupted manner. Therefore, it is important to ensure that the medicine supply chain is strengthened. A transparent procurement procedure influences quality and affordability and is essential to ensure a reliable supply of medicines. Inefficient procurement systems have been found to pay up to many times the world market price for essential medicines. Poor-quality medicines or delayed deliveries from unreliable suppliers contribute to an unnecessary waste of budgets, life-threatening shortages, antimicrobial resistance and avoidable fatalities.16

Procurement and supply chain systems involving public health-care institutions are weak and poorly governed. On the one hand, an inefficient medicine procurement system leads to suboptimal use of resources with poor value for money. A decentralized procurement system fails to optimize monopsony power, thereby leading to a bloated government budget for procuring medicines. On the other hand, an unreliable distribution system causes chronic shortage and acute stock-outs of essential medicines. However, pooled procurement models in some states of India (e.g. Tamil Nadu) have demonstrated their effectiveness in ensuring timely availability of free essential medicines and avoiding stock-outs of medicines.13

In an effort to address the issues outlined above, the State Government of Rajasthan in India introduced the Mukhyamantri Nishulk Dawa Yojana (MNDY; Chief Minister’s free medicine scheme) by establishing the Rajasthan Medical Services Corporation (RMSC) in May 2011. The scheme was launched on 2 October 2011 with the primary objective of procurement and distribution of generic medicines and surgical and diagnostic equipment to all patients visiting public health-care facilities. Essential medicines were identified initially by alignment with the National List of Essential Medicines of India, but they were modified and expanded to add more medicines as per the need of the population. While the RMSC began with about 240 medicines initially, at present there are more than 600 medicines on the RMSC essential medicines list. The RMSC procures medicines and surgical items through an open tender (two bid) system and also procures high-end medicines for cancer and other complex diseases directly from the importers. Supply chain management is carried out through “e-Aushadhi”, a web-based application developed for continuous monitoring and smooth functioning of the organization (medicine management system), and by the establishment of one medicine warehouse in each district, which is linked to public health-care facilities.

This paper sets out to evaluate the scheme by examining the financial implications of providing free medicines to everyone for the 70 million people in the region. We generated evidence by looking at the implications of financial and physical access to medicines in the State of Rajasthan in the post-2011 period.

METHODS

The basic framework for this paper is derived from the WHO universal health coverage (UHC) concept. The framework essentially describes three dimensions to achieve universal health coverage: breadth of coverage (population covered), depth of coverage (services offered) and height of coverage (financial risk protection provided). Extending the framework to universal access to medicines, we examined all three dimensions. We used the number of outpatient and inpatient visits as a proxy for population coverage, while the number of medicines covered in the essential drug list – availability and stock-outs – as a surrogate for service coverage. For proportion
of costs covered, we used current trends in household OOP expenditure in addition to the cost borne by the government in procuring medicines.

We used a variety of data/information available from secondary data sets as well as conducting a large primary survey of health-care facilities. From the electronic information system (e-Aushadhi) of the RMSC, we were able to obtain the financial allocation made to each district and facility for supplying medicines. Passbook data from facilities were used to determine financial allocations and utilization of medicines across facilities. The study also analysed unpublished unit-level records of the consumer expenditure surveys (CES) conducted by the National Sample Survey Office (NSSO), for the respective years. The CES collect information on household expenditure on about 350 items. These include food and nonfood items, while the relevant nonfood items that are examined here are institutional and non-institutional medical spending of households.

Survey of health-care facilities: sampling

The primary objective of the survey of health-care facilities was to evaluate the availability of essential medicines in health-care facilities, and stock-outs. The State of Rajasthan in India is not only large but is also characterized by a high level of population heterogeneity. In view of its social, economic, demographic and cultural diversity, the selection of a representative number of facilities at the appropriate level of care was deemed vital to conduct a large-scale study. We used the statistical software N-Master to determine minimum sample size required to evaluate the availability of medicines and stock-outs at each level of health-care facility. Once a representative number of public health-care facilities had been chosen, we adopted a two-stage cluster sampling that followed two stages of selection: selection of districts in the State of Rajasthan, and selection of health-care facilities within the identified districts. The criteria for selection at each level of facility are outlined below.

In order to capture the socioeconomic diversity of the state, 10 (30%) of the total number (34) of districts were selected, based on economic and geographical indicators. The economic criteria identified per capita net district domestic product (NDDP) were used to rank the districts and then districts were selected using systematic sampling, to include the highest-ranked district, the lowest-ranked district and districts at equal intervals of economic ranking. (Per capita NDDP used for the study was an estimation for the year 2004–2005 at current prices, obtained from the Directorate of Economics and Statistics, Rajasthan.) This selection was then adjusted to include geographical criteria by mapping the districts on a political map to capture the best geographical representation of the state, to essentially ensure a spread of districts (see Table 1).

Health-care facilities are the primary sampling unit for capturing the scenario of availability of medicines and stock-outs, and prescription and dispensing patterns, in public health-care facilities. For the purpose of this study, health-care facilities were selected at each level of care, from medical colleges, representing the highest level of care, to primary health-care centres (PHCs), denoting the lowest level of care. Ideally, subcentres should have been the lowest level of care selected, but, because of the low volume and value of medicines dispensed at that care level, PHCs were used as the lowest level in this analysis.

One specialty tertiary-care hospital was selected: a government medical college in the state capital (Jaipur) that is the largest public sector hospital in the state. At the district level, one district hospital from each selected district was selected, making a total of 100 district hospitals.

Subsequently, 30% of community health-care centres (CHCs) were selected from each chosen district using the following formula: 

$$N = A \times D \times 30\%$$

where $N$ is the number of CHCs selected, $A$ is the mean number of CHCs per district, and $D$ is the total number of districts chosen.

In all, 34 CHCs were selected from the 10 districts. Four CHCs were chosen from larger districts such as Udaipur, Barmer, Bharatpur and Jhalawar, whereas three CHCs were chosen from Karauli, Chittorgarh, Jaipur, Churu, Bikaner and Baran. The selection of CHCs was made on the basis of accessibility, distance from the district headquarters and geographical location, so that the CHC chosen was the most representative of the district population. Finally, 68 PHCs were selected on the basis of two PHCs reporting to each selected CHC, using random sampling.

For the purpose of this study, a list of common medicines was identified from the National List of Essential Medicines and the RMSC state essential medicines list. A total of 160 medicines from different therapeutic categories were identified and segregated based on their availability in different care levels, as suggested by national public health guidelines. However, not all of these drugs were procured by the RMSC. In order to capture the availability of drugs that have been procured by the RMSC, we excluded non-procured drugs from the list. As

<table>
<thead>
<tr>
<th>Type of facility</th>
<th>Number of sample facilities selected</th>
<th>Total number of facilities in 10 districts</th>
<th>Number selected as a percentage of total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Community health-care centre</td>
<td>34</td>
<td>376</td>
<td>9.04</td>
</tr>
<tr>
<td>Primary health-care centre</td>
<td>68</td>
<td>1517</td>
<td>4.48</td>
</tr>
<tr>
<td>Medical college</td>
<td>1</td>
<td>7</td>
<td>14.29</td>
</tr>
<tr>
<td>Total number of facilities</td>
<td>113</td>
<td>1900</td>
<td>5.42</td>
</tr>
</tbody>
</table>

Source: information on the total number of public health-care facilities was obtained from the Ministry of Health and Family Welfare, Government of India.
a result, there were 75 drugs relevant for the PHCs, 122 drugs relevant for the CHCs, 130 drugs for the district hospitals, and 141 drugs for the medical college surveyed. The medicines were also further segregated based on dosage and types (injectable, tablets/capsules, suspension). The essential generic medicines were then segregated based on the Anatomical Therapeutic Chemical Classification System as per WHO guidelines. Data missing from the primary survey was estimated to be 0.6%.

For assessing availability and stock-outs of essential medicines at the facility level, the facility availability and stock-out tool was completed directly by each facility to record data on medicine availability on the day of the survey, medicine stock-out position for the previous 6 months from the date of the survey and duration of stock-outs. Additional data on inpatient and outpatient visits over the past 3 years (2011, 2012, 2013), dispensing and other relevant information were also collected. The survey was conducted during the month of June 2013.

RESULTS

The study findings are presented vis-à-vis the three dimensions of UHC: cost coverage, population coverage and service coverage. Bearing in mind the inherent difficulties in measuring coverage, there was no attempt to measure these dimensions. Rather, the UHC framework has been used to explain the results.

Cost coverage

Before the introduction of MNDY, per capita public spending on medicines was particularly low in Rajasthan. During the years 2010–2011, per capita government spending on medicines was as low as ₹5.7 and increased sharply to about ₹50 during 2012–2013. Between 2006–2007 and 2010–2011, per capita public spending on medicines declined at an average rate of 20% per annum, while between 2010–2011 and 2013–2014 there was an annual mean growth rate of 105%, reflecting a doubling of expenditure every year (Figure 1). However, additional investment of ₹3000 million in the RMSC was less than a tenth (8%) of the state budget on health and family welfare (2012–2013). Persistent inadequacy in public spending results in high OOP payments. Per capita OOP expenditure has risen significantly in the State of Rajasthan as well as in India as a whole over the period from 1993–1994 to 2011–2012 (Table 2). However, per capita OOP spending on health care, as well as on medicines, was lower in Rajasthan than that for all India for the period under consideration. The difference in spending widened further in 2011–2012. Although this demonstrates an early trend, we note that the spending pattern of households in Rajasthan is undergoing significant change, as the OOP trend demonstrates that it is declining due to a notable decline in spending on medicines.

A decline and a lower level of OOP spending on medicines had a salutary effect on poverty. During 1993–1994 to 2011–2012, the national average for poverty as a result of OOP spending on medicines was 3.1%, versus 2.2% for Rajasthan (Figure 2). This scenario for Rajasthan is almost comparable to 2.1% in the state of Tamil Nadu, which has been supplying medicines free in its public health-care facilities for the past 16 years. Most significant is the low level of poverty in urban areas in 2011–2012. Compared with 1.64% of people falling below the poverty line owing to spending on medicines at the national level, in Rajasthan only 0.94% of urban residents were impoverished. Though it might be little early to attribute this to MNDY, since the NSSO survey was conducted between

![Figure 1: Rising per capita public spending on medicines in Rajasthan: current and constant prices](source: Department of Medical and Public Health, Government of Rajasthan (various years))
July 2011 and June 2012, this could be taken as an early trend suggesting a marginal decline in poverty. It should be mentioned that the scheme was first rolled out in urban areas and then gradually spread to rural areas.

### Population coverage

One encouraging outcome of the initiative is that the patient load in public health-care facilities has risen since the introduction of MNDY. A triangulation of the primary survey findings with government management information system data on outpatient and inpatient visits was attempted as part of this study. During 2011–2012, the growth in-patient load was 42.6% compared with 13.8% during 2010–2011. While it is too early to estimate the growth in the year 2012–2013, the growth is expected to be significantly higher than the previous years, as the overall number of visits (including outpatient and inpatient load) stood at 7.7 million in July 2013 as against 5.4 million in July 2012 according to data from the Health Management Information System, Rajasthan.

The evidence is further corroborated from the survey data, which demonstrate that in all health-care facilities, patient visits – both inpatient and outpatient visits – increased substantially. Figure 3 shows a substantial rise in outpatient care visits between 2011 and 2013 across all the districts surveyed. Results from the facility survey also show that annual average load has increased across PHCs, CHCs and district hospitals (Table 3). For instance, a PHC was handling

<table>
<thead>
<tr>
<th>Year</th>
<th>State/country</th>
<th>Per capita OOP expenditure on health care (₹)</th>
<th>Per capita OOP expenditure on medicines (₹)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Rural</td>
<td>Urban</td>
<td>Total</td>
</tr>
<tr>
<td>1993–1994</td>
<td>Rajasthan</td>
<td>12.5</td>
<td>18.0</td>
</tr>
<tr>
<td>2004–2005</td>
<td>Rajasthan</td>
<td>31.2</td>
<td>47.9</td>
</tr>
<tr>
<td>2011–2012</td>
<td>Rajasthan</td>
<td>91.5</td>
<td>107.4</td>
</tr>
<tr>
<td></td>
<td>India</td>
<td>18.6</td>
<td>18.3</td>
</tr>
<tr>
<td></td>
<td>India</td>
<td>36.5</td>
<td>57.6</td>
</tr>
<tr>
<td></td>
<td>India</td>
<td>95.3</td>
<td>151.2</td>
</tr>
</tbody>
</table>

OOP: out-of-pocket

Source: values have been estimated by the authors from unit level records of respective consumer expenditure surveys by the National Sample Survey Office.
Table 3: Average number of outpatient and inpatient visits and estimated total number of visits (million) by level of care

<table>
<thead>
<tr>
<th>Level of care</th>
<th>OP/IP</th>
<th>Year</th>
<th>Number of facilities</th>
<th>Mean number of visits</th>
<th>95% CI</th>
<th>Estimated total number of visits across all facilities (millions)</th>
</tr>
</thead>
<tbody>
<tr>
<td>PHC OP</td>
<td>2011</td>
<td>61</td>
<td>7334</td>
<td>5845–8823</td>
<td>11.21</td>
<td></td>
</tr>
<tr>
<td></td>
<td>2012</td>
<td>66</td>
<td>7912</td>
<td>6348–9475</td>
<td>12.75</td>
<td></td>
</tr>
<tr>
<td></td>
<td>2013a</td>
<td>66</td>
<td>9806</td>
<td>7646–11 967</td>
<td>15.81</td>
<td></td>
</tr>
<tr>
<td></td>
<td>IP</td>
<td>2011</td>
<td>62</td>
<td>256</td>
<td>0.39</td>
<td></td>
</tr>
<tr>
<td></td>
<td>2012</td>
<td>65</td>
<td>271</td>
<td>213–329</td>
<td>0.44</td>
<td></td>
</tr>
<tr>
<td></td>
<td>2013a</td>
<td>65</td>
<td>330</td>
<td>240–420</td>
<td>0.53</td>
<td></td>
</tr>
<tr>
<td>CHC OP</td>
<td>2011</td>
<td>30</td>
<td>42 805</td>
<td>29 249–56 361</td>
<td>16.27</td>
<td></td>
</tr>
<tr>
<td></td>
<td>2012</td>
<td>34</td>
<td>48 919</td>
<td>35 124–62 714</td>
<td>20.94</td>
<td></td>
</tr>
<tr>
<td></td>
<td>2013a</td>
<td>33</td>
<td>64 381</td>
<td>46 239–82 524</td>
<td>27.56</td>
<td></td>
</tr>
<tr>
<td></td>
<td>IP</td>
<td>2011</td>
<td>28</td>
<td>3769</td>
<td>1.43</td>
<td></td>
</tr>
<tr>
<td></td>
<td>2012</td>
<td>32</td>
<td>3791</td>
<td>2483–5100</td>
<td>1.62</td>
<td></td>
</tr>
<tr>
<td></td>
<td>2013a</td>
<td>31</td>
<td>3904</td>
<td>2654–5154</td>
<td>1.67</td>
<td></td>
</tr>
<tr>
<td>DH OP</td>
<td>2011</td>
<td>10</td>
<td>262 232</td>
<td>211 980–312 485</td>
<td>8.92</td>
<td></td>
</tr>
<tr>
<td></td>
<td>2012</td>
<td>10</td>
<td>264 765</td>
<td>197 626–331 904</td>
<td>9.00</td>
<td></td>
</tr>
<tr>
<td></td>
<td>2013a</td>
<td>10</td>
<td>372 601</td>
<td>280 279–464 924</td>
<td>12.67</td>
<td></td>
</tr>
<tr>
<td></td>
<td>IP</td>
<td>2011</td>
<td>10</td>
<td>31 485</td>
<td>1.07</td>
<td></td>
</tr>
<tr>
<td></td>
<td>2012</td>
<td>10</td>
<td>34 998</td>
<td>18 607–51 388</td>
<td>1.19</td>
<td></td>
</tr>
<tr>
<td></td>
<td>2013a</td>
<td>9</td>
<td>34 825</td>
<td>17 866–51 784</td>
<td>1.18</td>
<td></td>
</tr>
</tbody>
</table>

CHC: community health-care centre; CI: confidence interval; DH: district hospital; IP: inpatient; OP: outpatient; PHC: primary health-care centre
*2013 data are for 6 months (up to June 2013). The data for Jaipur exclude those of the medical college.
Source: estimated based on survey data.
an average of 7334 outpatient visits in 2011. This increased to 7912 visits in 2012. However, by June 2013, PHCs had an average of 9806 visits. Similar trends can be seen at CHCs and district hospitals. It was observed from the survey data that increases in inpatient visits were relatively moderate during the survey period, compared with outpatient visits. Based on the average number of visits across the facilities surveyed, the total outpatient and inpatient visits at various levels of care have been estimated. The estimated outpatient load at PHCs increased from 11.2 million in 2011, to 15.8 million by June 2013. Similarly for CHCs, the estimated load increased from 16.3 million to 27.6 million, and for district hospitals the estimated load increased from 8.9 million to 12.7 million. The results clearly show that CHCs have emerged as major points of service delivery for both outpatient and inpatient care and this suggests future possibilities for strengthening the system.

Service coverage

Regarding medicines, the benefit package offered currently in the public health-care facilities in Rajasthan is perhaps the most comprehensive, as over 600 essential medicines are covered, which is more than double the number on the National List of Essential Medicines. However, identifying a comprehensive list of essential drugs is only the first step in the commitment by the government, as operationalization is an important challenge. Therefore, the availability and stock-out scenario of key essential medicines in public health facilities was investigated. Figure 4 shows a box plot of the average number of medicines available during the day of the survey across PHCs, CHCs and district hospitals. In Figure 5, it is encouraging to observe that, out of the drugs relevant for each level of care, median availability of medicines at the PHC level was 61% and at the CHC level it was 64%, whereas at the district hospital level availability went up to 75%. There was significant variation across districts, but the variations were most pronounced for PHCs. For instance, the percentage of medicines available in PHCs varied from 30.6% to 88.6% on the day of the survey (Figure 5).

The RMSC has controlled central medicine procurement and the localized (through public health-care facilities) distribution system since October, 2011. In the process, RMSC maintains data on the value of the annual disbursement (consumption) of medicines in the e-Aushadi database. During 2012–2013, 442 types of medicines, worth ₹1850 million, were disbursed by the RMSC via 34 district drug warehouses located in 33 districts of Rajasthan. In order to determine the coverage of these medicines in terms of disease conditions, they have been categorized into therapeutic supergroups as per WHO guidelines. Of these, more than half (52%) were anti-infectives (Figure 6). The other important categories included blood and blood-forming agents (10.7%), drugs related to the alimentary tract and metabolism (8.6%), drugs related to the respiratory system (5.3%) and dermatological agents (5.3%). All the major categories of drugs are being provided by RMSC, though there is a strong bias towards anti-infectives.
**DISCUSSION**

From a health system perspective, achieving universal health coverage would mean providing a basic minimum of health services to the entire population and removing financial barriers to access them. This paper attempts to focus on one very critical aspect of the health system – medicines. In most rich countries, in view of strong prepayment and risk-pooling mechanisms, medicines for specific health problems and health in general are provided free of cost. However, in resource-poor settings, risk-pooling methods are not only weak but their health status has been poor. First, health-care financing and provision is largely a private affair in large parts of LMICs, with India leading the way with nearly 70% of all health-care financing derived from households, while 70% of all household expenditure goes into buying medicines from the private market. Owing to persistent underinvestment, the private medicine market in India has thrived leaving households to incur catastrophic payments and thus vulnerable to impoverishment. In addition to poor public spending on medicines, procurement and supply chain systems involving PHC institutions are weak and poorly governed. On the one hand, an inefficient medicine procurement system leads to suboptimal use of resources with poor value for money. A decentralized procurement system fails to optimize monopsony power, thereby leading to an inflated government budget for procuring medicines. On the other hand, an unreliable distribution system leads to chronic shortage and acute stock-outs of essential medicines. However, pooled procurement models in some states of India (Tamil Nadu and Kerala) have demonstrated the effectiveness of such a model in ensuring timely availability of free essential medicines and avoiding stock-outs of medicines.

Following the success of this model, the Rajasthan government in India adopted a similar system in 2011. This was carried out as a major health sector reform initiative. The commitment of the Rajasthan government was matched by a substantial increase in allocation of funds. During 2013–2014, a sum of ₹3.20 billion was allocated to the scheme in comparison with ₹0.38 billion in 2011–2012. On average, the state was spending less than 5% of its public expenditure on medicines in the pre-MNDY years. The per capita health expenditure during the pre-MNDY scheme was estimated to be ₹5.7 during 2010–2011 which stands close to ₹50 during 2013–2014. This has a salutary impact on OOP reduction in the state. Early trends suggest that household OOP payments have declined.
Selvaraj et al.: Free access to medicines in Rajasthan

Figure 6: Distribution of drugs by therapeutic group: by value of spending, 2012–2013

A: alimentary tract and metabolism; B: blood and blood-forming organs; C: cardiovascular system; D: dermatologicals; G: genitourinary system and sex hormones; H: systemic hormonal preparations (excluding sex hormones) and insulins; J: anti-infectives for systemic use; L: antineoplastic and immunomodulating agents; M: musculoskeletal system; N: nervous system; P: antiparasitic products, insecticides and repellents; R: respiratory system; S: sensory organs; V: various

Source: RMSC

from 85% in 2004–2005 to nearly 75% in 2011–2012. Poverty caused by high household OOP expenditure on medicines appeared to have been reduced from 3.2 to 2.1%.

In terms of population coverage, it can be observed that any patient visiting the public health-care facilities is provided with medicines free of cost. Before the initiative, patients visiting public health-care institutions did not pay for the consultation, and then they were provided with prescriptions slips and expected to procure the drugs from retail outlets. However, as a result of the new initiative, the Government of Rajasthan has made medicine and diagnostic provision in public health-care facilities a cashless and paperless affair. One of the immediate and positive spin-offs from this initiative is the increase in outpatient visits and moderate rise in inpatient admissions. The combined number of outpatient and inpatient visits experienced a rapid increase from 3.44 million in July 2010 to 7.77 million in July 2013. The unprecedented upsurge in patient visits was caused partly by a significant rise in pent-up demand. As medicines are now available free of cost, people have started to attend public health-care facilities, putting pressure on the health system to improve further.

Regarding the benefit package, it is interesting to note that under the new initiative an unprecedented 600 plus essential drugs were identified and procured for dispensing at public health-care facilities. This is perhaps the most comprehensive coverage in the history of the public health-care system in India. The intention to provide a comprehensive list of medicines free of charge is ambitious, and a concerted strategy was evolved to strengthen the procurement systems and efforts were made to make the supply systems effective. All the 34 districts have well-functioning district warehouses that are interlinked to front-line facilities and to the procurement agency. This is backed up by an able software system that monitors drug movement and stock-out scenarios in government health-care facilities. As a result of this initiative, front-line public health facilities have reported fewer shortages and stock-outs. The results of this survey suggest that a PHC in Rajasthan is currently dispensing an average of 100 essential medicines, while in CHCs and district health facilities the numbers of essential medicines being dispensed are 180 and 300, respectively. The median percentage availability is about 61% in a PHC, and in a district hospital it is as high as 75%. This is substantially higher than the number of medicines found at
Can universal access to medicines be achieved in a resource-poor setting? This paper examines three dimensions of universal coverage from the past 2 years of an experiment in Rajasthan, India. The 2 years’ experience of MNDY points to an overall improvement in access to health care, financial risk protection and health system expansion. The efficiency of the procurement process has significantly improved, while delivery of medicines and supplies has been made very effective. This has been made possible by a modest increase in public spending on medicines. While the underlying reforms associated with accelerated investment are a bold and innovative step, there is need to emphasize their sustenance. Rather than treating it as a one-off project-based initiative, the Government of Rajasthan must endeavour to institutionalize these reforms. Improvement in drug availability must go in tandem with the availability of health workforce. Critical shortages of health workforce, especially specialist doctors and pharmacists, needs to be addressed. The recent drive to appoint pharmacists permanently at various levels, including at the primary level, would serve as a critical milestone in effective delivery and management of medicines at various health-care levels in the State of Rajasthan.

As India has recently outlined its intent to roll-out a path of UHC, achieving universal access to medicines could be a first stepping stone. Given its potential as a “pharmacy of the global south”, and as the country has been able to achieve rapid and substantial economic growth in the past two decades, fiscal challenges are now less of a concern in allocation of additional resources. The experience and evidence generated from this study clearly points to the need for replication and rapid scale-up of such a model in other states which are struggling to get their act together in medicine procurement and distribution.

Another critical need at present is a large-scale impact evaluation through household sample surveys to help understand the implications of the Rajasthan scheme on the health status of the population and poverty, and the catastrophic impact as a result of a change in household OOP spending, and impact on borrowing and distress asset-selling practices, loss of wages, etc.

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Good health is essential to human welfare and to sustained economic and social development. WHO Member States have set themselves the target of developing their health financing systems to ensure that all people can use health services, while being protected against financial hardship associated with paying for them.

This paper was written on the basis of consultations and discussions with country representatives, technical experts and global health and development partners, including an online consultation based on a draft paper.
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